



Luksa, Melissa <mluksa@blm.gov>

Hines Federal 1H-0235X API#35-051-24117

1 message

Luksa, Melissa <mluksa@blm.gov>

Thu, Mar 15, 2018 at 1:32 PM

To Kimberleigh Rhodes <kirhodes@cimarex.com>

Kimberleigh,

I am working on the completion report and changing the status of this well to producing. However, Cimarex has not submitted CA's for Sec.35, 11N, 8W and Sec 2, 10N. 8W Grady County. We will also need an amendment for the multi-unit horizontal well. Please update me to where this is in the process. 100% of the production must be reported to the lease until we get the CA's in place.

Melissa

--

Melissa L. Luksa

Land Law Examiner

Bureau of Land Management

201 Stephenson Parkway, Ste. 1200

Norman, OK 73072

405-579-7143



United States Department of the Interior



BUREAU OF LAND MANAGEMENT
Oklahoma Field Office
201 Stephenson Parkway, Suite 1200
Norman, Oklahoma 73072
www.blm.gov/nm

In Reply Refer To
OKNM 020396
3105 (NM04000)

March 15, 2018

Memorandum

To: Land Law Examiner, Fluids Adjudication Section, NMSO- NM9220

From: Supervisory Land Law Examiner, Division of Minerals, OFO- NM0420

Subject: First Actual Production for Federal Lease No. OKNM 020396 located in Sec. 2, T. 10 N., R. 8 W. and Sec. 35, T. 11 N., R. 8 W., I.M., Canadian County, Oklahoma.

Date Well Spud. April 26, 2017
Date of First Production: August 28, 2017
Date of Completion: August 26, 2017

Well Name/Number:
Hines Federal 1H-0235X
API#: 35-051-24117

Well Operator/Address/Telephone No.:
Cimarex Energy Co. (918) 560-7275
202 S. Cheyenne Ave. Ste. 1000
Tulsa, OK 74103

SHL Location: SWSE, Sec. 2, T. 10 N., R. 08 W., I.M., Canadian County, OK (Actual)
BHL Location: NWNE, Sec. 35, T. 11 N., R. 08 W., I.M., Canadian County, OK (Actual)

Total Depth and Surface Elevation: TD: 21,634 Elev.: 1,278 GL
Producing Formation: Woodford (12,155' - 21,608')
Initial Daily Production: 496 BO, 3633 MCFG; 1919 BW
Well Capable of Production in Paying Quantities? Yes
Status: Producing Oil Well

Remarks: Federal Lease No. OKNM 020396 will be held by actual production effective August 28, 2017

If you have any questions or concerns please contact Melissa Luksa at 405-739-7143.

Tim Colon

cc:

ONRR- Reporting and Solid Minerals Services

P.O. Box 25165, MS 63230B

Denver, CO 80225

NM04200:Mluksa:x7143:3/15/18.M.\Norman\Minerals\Adjudication\Lease- FED\FPM\OKNM
20396.FPM.docx

☒ Well File- Correspondence: Hines Federal 1H-0235X

☐ Subject File

COMPLETION REPORT CHECKLIST

Well Name & No.: Hines Federal 1H-0235X

FPM: ✓ Add Well: _____

Agreement No.: NA

Leasehold No.: Oknm 20396

- ✓ Receive a Completion Report verify that the report is date stamped or received via E-commerce.
(Allocated wells: State Completion Report or Actual wells: 3160-4 form)
- ✓ Make 3 copies of Completion Report/3160-4 form: (1- CA, 2- Lease file and 3- ONRR)
Well file gets the original completion report/3160-4 and supporting documents: such as drilling surveys, logs, production tests, etc.
- ✓ Check producing or non-producing STATUS of leases in LR2000 (federal) and Access (Indian)
If non-producing status is this well actual or allocated, it will need a First Production Memo.
- NA Check producing or non-producing STATUS of **possible agreements** in LR2000 (federal) and Access (Indian)
Use GIS or IHS to locate possible agreements, is the well located within agreement boundaries?
- NA **Verify 4 additional items for POSSIBLE AGREEMENTS:**
 - Y/N Does the **COMMODITY** of well match commodity of agreement?
Agreements in LR2000 (federal), Access (Indian) 410- Gas ONLY, 451- Oil ONLY, 459- Oil & GAS
 - Y/N Verify **FORMATIONS** of the Completed well and Agreement, do they match?
 - Y/N Verify the well **OPERATOR** is a **valid** agreement operator, lessee of record, operating rights owner, or designated operator for Indian leases, if so do they match?
 - Y/N **TIMING:** Is the well production after the agreement becomes effective?
- ✓ Does this well meet agreement criteria, if yes...does the **agreement** have a First Prod Memo- actual or allocated?
- ✓ If required, Write First Production Memo. *For first wells on a lease or agreement use the appropriate memo form (Federal or Indian, Actual or Allocated) found at: M\ADJ\CA\Indian Templates or Federal Templates.*
- ✓ Update LR2000. Entries will be required for both Federal and Indian agreements, as needed, and for all affected Federal leases. *See instructions and examples.*
- ✓ Update AFMSS. Check "Cases" to verify that your well has not already been added, i.e. APD wells should have been added in the APD process. Complete all AFMSS screens, including remarks for Cases, Wells, Adjudication, and Approval by copying the remarks from the FPM. *See instructions and examples.*
- NA Update Access Agreements Database (holds both Indian & federal) *See instructions and examples.*
- NA Update Access Indian Leases Database. *See instructions and examples.*
- ✓ Enter Workload Accomplishments in the Workload Measures database:

New well in AFMSS:	FJ	1 unit
Federal FPM:	FI	1 unit
Indian FPM:	FI TRST	0 unit (No widget for Indian FPMs)
- NA Track FPM in CA Tracking Spreadsheet in the column for Adjudication comments. Use the following format:
FPM COMPLETED.
- ✓ Prepare Well File and Lease File (if needed)
(Follow **Well File** Instructions, Actual wells filed behind **Lease file**, Allocated wells behind **Agreement file**)

Name Melissa R. Luba Date 3/15/18



APD Adjudication Review

Well: Hines Federal 1H-0235X

Lease No.: OK NM 20394

Operator: Cimarex Energy Co

Primary- Expires: _____

Held by Production? Actual or Allocated

- ☒ Footages on APD front cover v. Survey Plat
☒ SHL and BHL within lease – check OG Plat and Serial Register Page/ACCESS
☒ Receipt if paper of \$9,610 APD Filing Fee _____ ☐ DWOA: Receipt of \$5,000 Fee paid on _____
☒ Original signature if paper APD? YES/NO
☐ GIS Geospatial Data (CD/Email) Deficiencies: Submitted Geospatial Data
☒ Surface Management Entity verification: ☒ check OG Plat, ☐ SUP, ☐ Carat, & ☐ Wall Map
 BIA Agency: _____
 USFS: private

- ☐ Surface Use Plan Include? Yes / No
☐ Landowner Access Agreement for Surface Needed? Yes / No
☐ Surface Use Agreement to Private Surface Owner? Yes / No
☐ Signature on Surface Access Agreement? Yes / No
☐ Signature on Certification page of SUP? Yes / No

- ☒ Bond Certification submitted in APD? Yes / No
☐ Operator verification – Bond must match Lessee of Record
☐ Check AFMSS bond screen
☐ LR2000 Federal Bond (NMSO Team 2) ☐ BIA Bond (Book or Request Copy from BIA)

- ☐ Unit? Yes/No
☐ If yes, PA? Yes/No
☐ If yes, PA# _____
☐ If yes, DOA? Yes/Missing/Not Needed

- ☒ Drilling Plan
☐ Field/Formation woodford
☐ Production: Oil/Gas Exp/Dev
☒ Correct well name appears on all maps, etc.

- ☒ Survey Plat should include:
☒ Township, Range, Section
☒ North Arrow
☒ Scale
☒ Monuments
☒ Basis of Elevation
☒ Basis of Bearings (Datum, NAD 83) or later
☒ Latitude and Longitude in decimal format (NAD 83)
☒ Signature of Land Surveyor & surveyor number
 (Original signature if paper APD)

- ☒ CA? Yes/No/Pending: _____
☐ Engineering COA's
☐ Environmental COA's
☐ OCC / TRC / KCC – Yes/No/Pending API # _____

6	5	4	3	<u>2</u>	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

T. 10 N., R. 8 W.

Deficiencies: 1) Geospatial Data 2) Surface access use agreement

Name: Melissa L. Lukosa

Date: 11/10/16

AFMSS 2- APD Review Checklist:

- € **PRINT** (reports plus attachments as they appear)
 - € 3160-3
 - € Application Data Report
 - € Drilling Plan Data Report
 - € SUPO Data Report
 - € Bond Data Report
- € **Create** a folder for the APD with a temporary label
- € **POST** Federal APD 3160-3
 - € Regular APD Whiteout items 15-23 & **PRINT** clean copy to post
 - € Tight Hole or Confidential APD whiteout BHL on item 4 & items 15-23 & make clean copy to post
 - € TX APDs: Add copy of Well Plat
- € **SCAN** APD to M drive; *Operator-Well Name Well Number* (for office reference)
- € **BIA/Forest Service Surface-** Generate Memo & Mail Courtesy Copy of APD
- € **PRINT** APD Review Checklist
- € **PRINT** APD Documents Checklist
- € **Complete** APD Review in AFMSS 2
 - € Bond- LR2000/AFMSS/Bond Book
 - € Lease – SRP/Indian Access/Copy of BIA Lease
 - € CA- SRP/Access database
 - € MTP
- € **Assign Analysts**
 - € **Complete** Adjudication Review (use checklist)
 - € **Generate** 10-day Letter
 - € Check Post Deficiency Reviews
 - € Adjudication Review
 - € Engineering Review
 - € Geological Review
 - € Surface Review
 - € **Print** 10 day letter for Engineer/Geo Supervisor Review
 - € **Submit** 10-day letter to Operator through AFMSS 2
- € Input well into AFMSS (Add Well)
- € Give GIS CD to specialists assigned to the APD and put photocopy of CD in the APD folder, noting who it was assigned to and when it was given
- € Prepare APD Checklist including specialist team assigned to APD
- € Email Team (template in APD Info folder on M drive)
- € Update Minerals Calendar (and personal calendar)
- € Update APD Board
- € Update Cindy's Report
 - € Month Sheet for "working on"
 - € New APD Sheet
 - € Pending APD Sheet
- € If Agency Surface, send (mail) un-adjudicated copy with memo
 - € USFS
 - € BIA
 - € Other

APD checklist-9.13.2016

Operator: Cimarex Energy Co

Well Name: Hines Federal

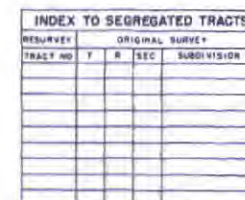
Well Number: 1H-0235X

- € 3160-3 (BLM form completed) ✓
- € (if applicable) Agent Authorization ✓
- € Well Location Plat ✓
- € Well Location Topographic Plat ✓
- € Proposed Pad site with elevation ✓
- € Proposed lease road ✓
- € (if applicable) Plan and Profile of a proposed pipeline
- € Topographic Vicinity Map ✓
- € Vicinity Plat ✓
- * → € Lease Plat
- € Drilling Program ✓
- € Surface Use Plan ✓
- * need BMD → € Bonder Certification
- € ~~Designation of Operator (DO)~~
- € 1 Mile Radius Plat ✓
- € Affidavit of notification (private surface only) ✓
- € Self-Certification Statement f/lessee/ operator as to the surface owner identification ✓
(private surface only)
- € (if applicable) Emergency Flood Plain- Best Management Practices

Geo. Rick
ADJ. Melissa
Env. Willem
Env. Ed

Notes:

MTP



FOR ORDERS EFFECTING DISPOSAL OR USE OF
UNIDENTIFIED LANDS WITHDRAWN FOR CLASSIFICATION
MINERALS, WATER AND/OR OTHER PUBLIC PURPOSES,
REFER TO INDEX OF MISCELLANEOUS DOCUMENTS

50 Temp Wd 9/19/1934 as to all undisposed
of lands



WARNING STATEMENT
This plot is the Bureau's Bureau of Files, and should be used only as a graphic display of the township survey data. It is not to be used for any other purpose, and should not be used for any other purpose. It is not to be used for any other purpose, and should not be used for any other purpose.

[illegible]

E. G. N.
R. B. W.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OFFER TO LEASE AND LEASE FOR OIL AND GAS

FORM APPROVED
OMB NO. 1004-0145
Expires: 11/30/2005

Serial Number
OKNM120396

The undersigned (reverse) offers to lease all or any of the lands in Item 2 that are available for lease pursuant to the Mineral Leasing Act of 1920, as amended and supplemented (30 U.S.C. 181 et seq.), the Mineral Leasing Act for Acquired Lands of 1947, as amended (30 U.S.C. 351-359), the Attorney General's Opinion of April 2, 1941 (40 Op. Atty. Gen. 41), or the Combined Hydrocarbon Leasing Act of 1981 (95 Stat 1070).

READ INSTRUCTIONS BEFORE COMPLETING

1. Name MARATHON OIL COMPANY
Street
City, State, Zip Code PO BOX 68
HOUSTON, TX 77001-0689

2. This application/offer/lease is for: (Check only One) ☐ PUBLIC DOMAIN LANDS ☒ ACQUIRED LANDS (percent U.S. interest 100%)
Surface managing agency if other than BLM: BUREAU OF RECLAMATION Unit/Project WASHITA BASIN PROJECT
Legal description of land requested: *Parcel No.: _____ *Sale Date (m/d/y): ____/____/____
*SEE ITEM 2 IN INSTRUCTIONS BELOW PRIOR TO COMPLETING PARCEL NUMBER AND SALE DATE.
T. _____ R. _____ Meridian _____ State _____ County _____

Amount remitted: Filing fee \$ _____

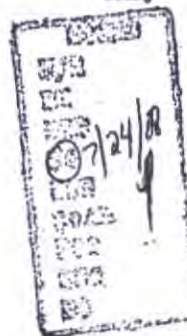
Rental fee \$ _____

Total acres applied for _____
Total \$ _____

DO NOT WRITE BELOW THIS LINE

3. Land included in lease:

T. 0090N R. 0130W Meridian IM State OK County Caddo
Sec. 013 E2SW,SESWSW;



Total acres in lease 90.000
Rental retained \$ 135.00

This lease is issued granting the exclusive right to drill for, mine, extract, remove and dispose of all the oil and gas (except helium) in the lands described in Item 3 together with the right to build and maintain necessary improvements thereupon for the term indicated below, subject to renewal or extension in accordance with the appropriate leasing authority. Rights granted are subject to applicable laws, the terms, conditions, and attached stipulations of this lease, the Secretary of the Interior's regulations and formal orders in effect as of lease issuance, and to regulations and formal orders hereafter promulgated when not inconsistent with lease rights granted or specific provisions of this lease.

NOTE: This lease is issued to the high bidder pursuant to his/her duly executed bid or nomination form submitted under 43 CFR 3120 and is subject to the provisions of that bid or nomination and those specified on this form.

Type and primary term of lease:

☐ Noncompetitive lease (ten years)

☒ Competitive lease (ten years)

☐ Other _____

THE UNITED STATES OF AMERICA

by _____

LAND LAW EXAMINER, FLUIDS ADJUDICATION TEAM

JUL 18 2008

(Title)

(Date)

EFFECTIVE DATE OF LEASE

AUG - 1 2008

4. (a) Undersigned certifies that (1) offeror is a citizen of the United States; an association of such citizens; a municipality; or a corporation organized under the laws of the United States or of any State or Territory thereof; (2) all parties holding an interest in the offer are in compliance with 43 CFR 3100 and the leasing rules; (3) offeror's chargeable interests, direct and indirect, in each public domain and acquired lands separately in the State, do not exceed 246,080 acres in oil and gas leases (of which 100,000 acres may be in oil and gas options), or 300,000 acres in leases in each leasing District in Alaska of which up to 200,000 acres may be in options; (4) offeror is not considered a minor under the laws of the State in which the lands covered by this offer are located; (5) offeror is in compliance with qualifications concerning Federal coal lease holdings provided in sec. 2(a)(2)(A) of the Mineral Leasing Act; (6) offeror is in compliance with reclamation requirements for all Federal oil and gas lease holdings as required by sec. 17(g) of the Mineral Leasing Act; and (7) offeror is not in violation of sec. 41 of the Act.

(b) Undersigned agrees that signature to this offer constitutes acceptance of this lease, including all terms, conditions, and stipulations of which offeror has been given notice, and any amendment or separate lease that may include any land described in this offer open to leasing at the time this offer was filed but omitted for any reason from this lease. The offeror further agrees that this offer cannot be withdrawn, either in whole or in part, unless the withdrawal is received by the proper BLM State Office before this lease, an amendment to this lease, or a separate lease, whichever covers the land described in the withdrawal, has been signed on behalf of the United States.

This offer will be rejected and will afford offeror no priority if it is not properly completed and executed in accordance with the regulations, or if it is not accompanied by the required payments. 18 U.S.C. Sec. 1001 makes it a crime for any person knowingly and willfully to make to any Department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

Duly executed this _____ day of _____, 20_____

(Signature of Lessee or Attorney-in-fact)

LEASE TERMS

Sec. 1. Rentals—Rentals shall be paid to proper office of lessor in advance of each lease year. Annual rental rates per acre or fraction thereof are:

- (a) Noncompetitive lease, \$1.50 for the first 5 years; thereafter \$2.00;
- (b) Competitive lease, \$1.50; for the first 5 years; thereafter \$2.00;
- (c) Other, see attachment, or as specified in regulations at the time this lease is issued.

If this lease or a portion thereof is committed to an approved cooperative or unit plan which includes a well capable of producing leased resources, and the plan contains a provision for allocation of production, royalties shall be paid on the production allocated to this lease. However, annual rentals shall continue to be due at the rate specified in (a), (b), or (c) for those lands not within a participating area.

Failure to pay annual rental, if due, on or before the anniversary date of this lease (or next official working day if office is closed) shall automatically terminate this lease by operation of law. Rentals may be waived, reduced, or suspended by the Secretary upon a sufficient showing by lessee.

Sec. 2. Royalties—Royalties shall be paid to proper office of lessor. Royalties shall be computed in accordance with regulations on production removed or sold. Royalty rates are:

- (a) Noncompetitive lease, 12 1/4 %;
- (b) Competitive lease, 12 1/4 %;
- (c) Other, see attachment; or as specified in regulations at the time this lease is issued.

Lessor reserves the right to specify whether royalty is to be paid in value or in kind, and the right to establish reasonable minimum values on products after giving lessee notice and an opportunity to be heard. When paid in value, royalties shall be due and payable on the last day of the month following the month in which production occurred. When paid in kind, production shall be delivered, unless otherwise agreed to by lessor, in merchantable condition on the premises where produced without cost to lessor. Lessee shall not be required to hold such production in storage beyond the last day of the month following the month in which production occurred, nor shall lessee be held liable for loss or destruction of royalty oil or other products in storage from causes beyond the reasonable control of lessee.

Minimum royalty in lieu of rental of not less than the rental which otherwise would be required for that lease year shall be payable at the end of each lease year beginning on or after a discovery in paying quantities. This minimum royalty may be waived, suspended, or reduced, and the above royalty rates may be reduced, for all or portions of this lease if the Secretary determines that such action is necessary to encourage the greatest ultimate recovery of the leased resources, or is otherwise justified.

An interest charge shall be assessed on late royalty payments or underpayments in accordance with the Federal Oil and Gas Royalty Management Act of 1982 (FOGRMA) (30 U.S.C. 1701). Lessee shall be liable for royalty payments on oil and gas lost or wasted from a lease site when such loss or waste is due to negligence on the part of the operator, or due to the failure to comply with any rule, regulation, order, or citation issued under FOGRMA or the leasing authority.

Sec. 3. Bonds—A bond shall be filed and maintained for lease operations as required under regulations.

Sec. 4. Diligence, rate of development, unitization, and drainage—Lessee shall exercise reasonable diligence in developing and producing, and shall prevent unnecessary damage to, loss of, or waste of leased resources. Lessor reserves right to specify rates of development and production in the public interest and to require lessee to subscribe to a cooperative or unit plan, within 30 days of notice, if deemed necessary for proper development and operation of area, field, or pool embracing these leased lands. Lessee shall drill and produce wells necessary to protect leased lands from drainage or pay compensatory royalty for drainage in amount determined by lessor.

Sec. 5. Documents, evidence, and inspection—Lessee shall file with proper office of lessor, not later than 30 days after effective date thereof, any contract or evidence of other arrangement for sale or disposal of production. At such times and in such form as lessor may prescribe, lessee shall furnish detailed statements showing amounts and quality of all products removed and sold, proceeds therefrom, and amount used for production purposes or unavoidably lost. Lessee may be required to provide plots and schematic diagrams showing development work and improvements, and reports with respect to parties in interest, expenditures, and depreciation costs. In the form prescribed by lessor, lessee shall keep a daily drilling record, a log, information on well surveys and tests, and a record of subsurface investigations and furnish copies to lessor when required. Lessee shall keep open at all reasonable times for inspection by any authorized officer of lessor, the leased premises and all wells, improvements, machinery, and fixtures thereon, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or in the leased lands. Lessee shall maintain copies of all contracts, sales agreements, accounting records, and documentation such as billings, invoices, or similar documentation that supports

costs claimed as manufacturing, preparation, and/or transportation costs. All such records shall be maintained in lessee's accounting offices for future audit by lessor. Lessee shall maintain required records for 6 years after they are generated or, if an audit or investigation is underway, until released of the obligation to maintain such records by lessor.

During existence of this lease, information obtained under this section shall be closed to inspection by the public in accordance with the Freedom of Information Act (5 U.S.C. 552).

Sec. 6. Conduct of operations—Lessee shall conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to other land uses or users. Lessee shall take reasonable measures deemed necessary by lessor to accomplish the intent of this section. To the extent consistent with lease rights granted, such measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. Lessor reserves the right to continue existing uses and to authorize future uses upon or in the leased lands, including the approval of easements or rights-of-way. Such uses shall be conditioned so as to prevent unnecessary or unreasonable interference with rights of lessee.

Prior to disturbing the surface of the leased lands, lessee shall contact lessor to be apprised of procedures to be followed and modifications or reclamation measures that may be necessary. Areas to be disturbed may require inventories or special studies to determine the extent of impacts to other resources. Lessee may be required to complete minor inventories or short term special studies under guidelines provided by lessor. If in the conduct of operations, threatened or endangered species, objects of historic or scientific interest, or substantial unanticipated environmental effects are observed, lessee shall immediately contact lessor. Lessee shall any operations that would result in the destruction of such species or objects.

Sec. 7. Mining operations—To the extent that impacts from mining operations would be substantially different or greater than those associated with normal drilling operations, lessee reserves the right to deny approval of such operations.

Sec. 8. Extraction of helium—Lessor reserves the option of extracting or having extracted helium from gas production in a manner specified and by means provided by lessor at no expense or loss to lessee or owner of the gas. Lessee shall include in any contract of sale of gas the provisions of this section.

Sec. 9. Damages to property—Lessee shall pay lessor for damage to lessor's improvements, and shall save and hold lessor harmless from all claims for damage or harm to persons or property as a result of lease operations.

Sec. 10. Protection of diverse interests and equal opportunity—Lessee shall: pay when due all taxes legally assessed and levied under laws of the State or the United States; accord all employees complete freedom of purchase; pay all wages at least twice each month in lawful money of the United States; maintain a safe working environment in accordance with standard industry practices; and take measures necessary to protect the health and safety of the public.

Lessor reserves the right to ensure that production is sold at reasonable prices and to prevent monopoly. If lessee operates a pipeline, or owns controlling interest in a pipeline or a company operating a pipeline, which may be operated accessible to oil derived from these leased lands, lessee shall comply with section 28 of the Mineral Leasing Act of 1920.

Lessee shall comply with Executive Order No. 11246 of September 24, 1963, as amended, and regulations and relevant orders of the Secretary of Labor issued pursuant thereto. Neither lessee nor lessee's subcontractors shall maintain segregated facilities.

Sec. 11. Transfer of lease interests and relinquishment of lease—As required by regulations, lessee shall file with lessor any assignment or other transfer of an interest in this lease. Lessee may relinquish this lease or any legal subdivision by filing in the proper office a written relinquishment, which shall be effective as of the date of filing, subject to the continued obligation of the lessee and surety to pay all accrued rentals and royalties.

Sec. 12. Delivery of premises—At such time as all or portions of this lease are returned to lessor, lessee shall place affected wells in condition for suspension or abandonment, reclaim the area as specified by lessor and, within a reasonable period of time, remove equipment and improvements not deemed necessary by lessor for preservation of productive wells.

Sec. 13. Proceedings in case of default—If lessee fails to comply with any provisions of this lease, and the noncompliance continues for 30 days after written notice thereof, this lease shall be subject to cancellation unless or until the leasehold contains a well capable of production of oil or gas in paying quantities, or the lease is committed to an approved cooperative or unit plan or communitization agreement which contains a well capable of production of unitized substances in paying quantities. This provision shall not be construed to prevent the exercise by lessor of any other legal and equitable remedy, including waiver of the default. Any such remedy or waiver shall not prevent later cancellation for the same default occurring at any other time. Lessee shall be subject to applicable provisions and penalties of FOGRMA (30 U.S.C. 1701).

Sec. 14. Heirs and successors-in-interest—Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall inure to the heirs, executors, administrators, successors, beneficiaries, or assignees of the respective parties hereto.

SPECIAL STIPULATION
BUREAU OF RECLAMATION

To avoid interference with recreation development and/or impacts to fish and wildlife habitat and to assist in preventing damage to any Bureau of Reclamation dams, reservoirs, canals, ditches, laterals, tunnels, and related facilities, and contamination of the water supply therein, the lessee agrees that the following conditions shall apply to all exploration and developmental activities and other operation of the works thereafter on lands covered by this lease:

1. Prior to commencement of any surface-disturbing work including drilling, access road work, and well location construction, a surface use and operations plan will be filed with the appropriate officials. A copy of this plan will be furnished to the Area Manager Oklahoma-Texas Area Office, Great Plains Region, Bureau of Reclamation, 5924 NW 2nd Street, Suite 200, Oklahoma City, Oklahoma 73127, for review and consent prior to approval of the plan. Such approval will be conditioned on reasonable requirements needed to prevent soil erosion, water pollution, and unnecessary damages to the surface vegetation and other resources, including cultural resources, of the United States, its lessees, permittees, or licensees, and to provide for the restoration of the land surface use and vegetation. The plan shall contain provisions as the Bureau of Reclamation may deem necessary to maintain proper management of the water, recreation, lands, structures, and resources, including cultural resources, within the prospecting, drilling, or construction area.

Drilling sites for all wells and associated investigations such as seismograph work shall be included in the above-mentioned surface use and operation plan.

If later explorations require departure from, or additions to the approved plan, these revisions or amendments, together with a justification statement for proposed revisions, will be submitted for approval to the Area Manager, Oklahoma-Texas Area Office, Bureau of Reclamation, or his authorized representative.

Any operations conducted in advance of approval of an original, revised, or amended prospecting plan, or which are not in accordance with an approved plan, constitute a violation of the terms of this lease. The Bureau of Reclamation reserves the right to close down operations until such corrective action, as is deemed necessary, is taken by the lessee.

2. No occupancy of the surface of the following excluded areas is authorized by this lease. It is understood and agreed that the use of these areas for Bureau of Reclamation purposes is superior to any other use. The following restrictions apply only to mineral tracts located within the boundary of a Bureau of Reclamation Project where the United States owns 100 percent of the fee mineral interest.

- a. Within 500 feet on either side of the centerline of any and all roads or highways within the leased area.**
- b. Within 200 feet on either side of the centerline of any and all trails within the leased area.**
- c. Within 500 feet of the normal high-water line of any and all live streams in the leased area.**
- d. Within 400 feet of any and all recreation developments within the leased area.**
- e. Within 400 feet of any improvements either owned, permitted, leased, or otherwise authorized by the Bureau of Reclamation within the leased area.**
- f. Within 200 feet of established crop fields, food plots, and tree/shrub plantings within the leased area.**
- g. Within 200 feet of slopes steeper than a 2:1 gradient within the leased area.**
- h. Within established rights-of-way of canals, laterals, and drainage ditches within the leased area.**
- i. Within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater, for irrigation facilities without clearly marked rights-of-way within the leased area.**
- j. Providing that appropriate environmental compliance measures can be ensured, and providing further that Reclamation project works and other public interests can be protected, Reclamation may consider, on a case-by-case basis, waiving the requirements specified in Section 2 hereof.**

HOWEVER, LESSEES ARE ADVISED THAT OBTAINING SUCH A WAIVER CAN BE A DIFFICULT, TIME CONSUMING, AND COSTLY PROCESS WITH NO GUARANTEE THAT RECLAMATION WILL GRANT THE REQUESTED WAIVER.

3. No occupancy of the surface or surface drilling will be allowed in the following areas. In addition, no directional drilling will be allowed that would intersect the subsurface zones delineated by a vertical plane in these areas. The following restrictions apply only to mineral tracts located within the boundary of a Bureau of Reclamation project where the United States owns 100% of the fee mineral interest.

- a. Within 1,000 feet of the maximum water surface, as defined in the Standard Operating Procedures (SOP), of any reservoirs and related facilities located within the leased area.**
- b. Within 2,000 feet of dam embankments and appurtenance structures such as spillway structures, outlet works, etc.**
- c. Within one-half (1/2) mile horizontal from the centerline of any tunnel within the leased area.**
- d. Providing that appropriate environmental compliance measures can be ensured, and providing further that Reclamation project works and other public interests can be protected, Reclamation may consider, on a case-by-case basis, waiving the requirements specified in Section 3 hereof.**

HOWEVER, LESSEES ARE ADVISED THE OBTAINING SUCH A WAIVER CAN BE A DIFFICULT, TIME CONSUMING, AND COSTLY PROCESS WITH NO GUARANTEE THAT RECLAMATION WILL GRANT THE REQUESTED WAIVER.

4. The distances stated in Items 2 and 3 above are intended to be general indicators only. The Bureau of Reclamation reserves the right to revise these distances as needed to protect Bureau of Reclamation facilities.

5. The use of explosives in any manner shall be so controlled that the works and facilities of the United States, its successors and assigns, will in no way be endangered or damaged. In this connection, an explosives use plan shall be submitted to and approved by the Area Manager, Oklahoma-Texas Office, Bureau of Reclamation, or his authorized representative.

6. The lessee shall be liable for all damage to the property of the United States, its successors and assigns, resulting from the exploration, development, or operation of the works contemplated by this lease, and shall further hold the United States, its successors and assigns, and its officers, agents, and employees, harmless from all claims of third parties for injury or damage sustained, or in any way resulting from, the exercise of the rights and privileges conferred by this lease.

7. The lessee shall be liable for all damage to crops or improvements of any entryman, non-mineral applicant, or patentee, their successors and assigns, caused by or resulting from, the drilling or other operations of the lessee, including reimbursement of any entryman or patentee, their successors and assigns, for all construction, operation, and maintenance charges becoming due on any portion of their said lands damaged as a result of the drilling or other operations of the lessee.

8. In addition to any other bond required under the provisions of this lease, the lessee shall provide such bond as the United States may at any time require for damages which may arise under the liability provisions of sections six (6) and seven (7) above.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
COMPETITIVE OIL AND GAS OR
GEOTHERMAL RESOURCES LEASE BID
30 U.S.C. 181 et seq.; 30 U.S.C. 351-35
30 U.S.C. 1001-1025; 42 U.S.C. 6508

OKNM 120396

FORM APPROVED
OMB NO. 1004-0074
Expires: December 31, 2009

State

NM

Date of Sale

4-16-08

PARCEL NUMBER	AMOUNT OF BID (see instructions below)	
	TOTAL BID	PAYMENT SUBMITTED WITH BID
THE BID IS FOR (check one): <input checked="" type="checkbox"/> Oil and Gas Parcel Number <u>200804-094</u>	78,750.00	455.00
<input type="checkbox"/> Geothermal Parcel Number _____ Name of Known Geothermal Resource Area (KGRA) _____		

The appropriate regulations applicable to this bid are: (1) for oil and gas leases--43 CFR 3120; (2) for National Petroleum Reserve-Alaska (NPR-A) leases--43 CFR 3132; and (3) for Geothermal resources leases--43 CFR 3220. (See details concerning lease qualifications on next page.)

I CERTIFY THAT I have read and am in compliance with; and not in violation of the lessee qualification requirements under the applicable regulations for this bid.

I CERTIFY THAT this bid is not in violation of 18 U.S.C. 1860 which prohibits unlawful combination or intimidation of bidders. I further certify that this bid was arrived at independently and is tendered without collusion with any other bidder for the purpose of restricting competition.

IMPORTANT NOTICE: Execution of this form where the offer is the high bid, constitutes a binding lease offer including all applicable terms and conditions. Failure to comply with the applicable laws and regulations under which this bid is made will result in rejection of the bid and forfeiture of all monies submitted.

MARATHON Oil Company

Print or Type Name of Lessee

P.O. Box 68

Address of Lessee

Houston

City

TEXAS

State

77001-0689

Zip

[Signature]

Signature of Lessee or Bidder

INSTRUCTIONS FOR OIL AND GAS BID
(Except NPR-A)

1. Separate bid for each parcel is required. Identify parcel by the parcel number assigned in the *Notice of Competitive Lease Sale*.
2. Bid must be accompanied by the national minimum acceptable bid, the first year's rental and the administrative fee. The remittance must be in the form specified in 43 CFR 3103.1-1. The remainder of the bonus bid, if any, must be submitted to the proper Bureau of Land Management (BLM) office within 10 working days after the last day of the oral auction. Failure to submit the remainder of the bonus bid within 10 working days will result in rejection of the bid offer and forfeiture of all monies paid.
3. If the bidder is not the sole party in interest in the lease for which the bid is submitted, all other parties in interest may be required to furnish evidence of their qualifications upon written request by the BLM.
4. This bid may be executed (signed) before the oral auction. If signed before the oral auction, this form cannot be modified without being executed again.
5. In view of the above requirement (4), the bidder may wish to leave the AMOUNT OF BID section blank so that final bid amount may be either completed by the bidder or the BLM at the oral auction.

INSTRUCTIONS

INSTRUCTIONS FOR GEOTHERMAL OR
NPR-A OIL AND GAS BID

1. Separate bid for each parcel is required. Identify the parcel by the number assigned to a tract.
2. Bid must be accompanied by one-fifth of the total amount of the bid. The remittance must be in the form specified in 43 CFR 3220.4 for a Geothermal Resources bid and 3132.2 for a NPR-A lease bid.
3. Mark the envelope "Bid for Geothermal Resources Lease" in (Name of KGRA) or "Bid for NPR-A Lease," as appropriate. Be sure correct parcel number of tract on which the bid is submitted and date of bid opening are noted plainly on envelope. No bid may be modified or withdrawn unless such modification or withdrawal is received prior to time fixed for opening of bids.
4. Mail or deliver bid to the proper BLM office or place indicated in the *Notice of Competitive Lease Sale*.
5. If the bidder is not the sole party in interest in the lease for which bid is submitted, all other parties in interest may be required to furnish evidence of their qualifications upon written request by the BLM.

QUALIFICATIONS

For leases that may be issued as a result of this sale under the Mineral Leasing Act (The Act) of 1920; as amended, the oral bidder must: (1) Be a citizen of the United States; an association (including partnerships and trusts) of such citizens; a municipality; or a corporation organized under the laws of the United States or of any State or Territory thereof; (2) Be in compliance with acreage limitation requirements wherein the bidder's interests, direct and indirect, in oil and gas leases in the State identified do not exceed 246,080 acres each in public domain or acquired lands including acreage covered by this bid, of which not more than 200,000 acres are under options. If this bid is submitted for lands in Alaska, the bidder's holdings in each of the Alaska leasing districts do not exceed 300,000 acres, of which no more than 200,000 acres are under options in each district; (3) Be in compliance with Federal coal lease holdings as provided in sec. 2(a)(2)(A) of the Act; (4) Be in compliance with reclamation requirements for all Federal oil and gas holdings as required by sec. 17 of the Act; (5) Not be in violation of sec. 41 of the Act; and (6) Certify that all parties in interest in this bid are in compliance with 43 CFR Groups 3000 and 3100 and the leasing authorities cited herein.

For leases that may be issued as a result of this sale under the Geothermal Steam Act of 1970, as amended, the bidder must: (1) Be a Citizen of the United States; an association of such citizens; a municipality; or a corporation organized under the laws of the United States or of any State or Territory thereof; and (2) Be in compliance with acreage limitation requirements wherein the bidder's interests, direct and indirect, do not exceed 51,200 acres, and (3) Certify that all parties in interest in this bid are in compliance with 43 CFR Group 3200 and the leasing authority cited herein.

For leases that may be issued as a result of this sale under the Department of the Interior Appropriations Act of 1981, the bidder must: (1) Be a citizen or national of the United States; an alien lawfully admitted for permanent residence; a private, public or municipal corporation organized under the laws of the United States or of any State or Territory thereof; an association of such citizens, nationals, resident aliens or private, public or municipal corporations, and (2) Certify that all parties in interest in this bid are in compliance with 43 CFR Part 3130 and the leasing authorities cited herein.

NOTICES

The Privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this bid for a Competitive Oil and Gas or Geothermal Resources Lease.

AUTHORITY: 30 U.S.C. 181 et seq.; 30 U.S.C. 351-359; 30 U.S.C. 1001-1025; 42 U.S.C. 6508.

PRINCIPAL PURPOSE: The information is to be used to process your bid.

ROUTINE USES: (1) The adjudication of the bidder's right to the resources for which this bid is made. (2) Documentation for public information. (3) Transfer to appropriate Federal agencies when comment or concurrence is required prior to granting a right in public lands or resources. (4)(5) Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions.

EFFECT OF NOT PROVIDING INFORMATION: Disclosure of the information is voluntary. If all the information is not provided, your bid may be rejected.

The Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.) requires us to inform you that:

This information is being collected in accordance with 43 CFR 3120, 43 CFR 3130, or 43 CFR 3220.

The BLM collects this information to determine the bidder submitting the highest bid.

Response to this request is required to obtain a benefit.

The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 10 minutes per response including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0074), Bureau Information Collection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.



IN REPLY REFER TO:

OK-MB

United States Department of the Interior

BUREAU OF RECLAMATION
OKLAHOMA CITY FIELD OFFICE
5924 NW 2nd St., Suite 200
Oklahoma City, Oklahoma 73127-6514



Becky
12-3-07

NOV 29 2007

Ms. Becky C. Olivas
Bureau of Land Management
1474 Rodeo Road
Post Office Box 27115
Santa Fe, New Mexico 87502-0115

Subject: Expression of Interest from Reagan Smith Energy Solutions, Inc. to Offer a Competitive Oil and Gas Lease of Federal Mineral Interests in Sections, 28, 30, and 33, Township 9 North Range 12 West and Sections 12 and 24, Township 9 North, Range 13 West all in Custer County, Oklahoma, Washita Basin Project, Fort Cobb Reservoir (Your letter dated September 10, 2007)

Dear Ms. Olivas:

We have reviewed our project land files and do not object to offering the subject sections for competitive leasing, if the enclosed stipulations Form GP-135, Special Stipulations, Bureau of Reclamation General Stipulations, and/or Special Stipulation are included in the leases, as applicable.

All of the acreage is located within the Fort Cobb Wildlife Management Area, as follows:

Township 9 North, Range 12 West

1. Section 28: SW $\frac{1}{4}$ SW $\frac{1}{4}$; SE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$; SE $\frac{1}{4}$ SW $\frac{1}{4}$; NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$; S $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ (120 acres)

United States of America owns an undivided $\frac{1}{2}$ fee mineral interest in 70 acres of the above described 120-acre tract as follows:

(a) S $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$; NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$; SE $\frac{1}{4}$ SW $\frac{1}{4}$ (70 acres)

United States of America owns 100% fee mineral interest in 50 acres of the above described 120-acre tract as follows:

(b) S $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$; SW $\frac{1}{4}$ SW $\frac{1}{4}$ (50 acres)

OK 2. Section 30: Lot 3 and Lot 4 (also described as the W $\frac{1}{2}$ SW $\frac{1}{4}$) (82.72 acres)

discussing
3/2-07-01
2-1-07
100% 11-2-07

United States of America owns an undivided $\frac{1}{2}$ fee mineral interest in the above described 82.72-acre tract.

OK 3. Section 33: NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$; S $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$; SW $\frac{1}{4}$ SW $\frac{1}{4}$ (70 acres)

66.67%
1/5 min. int.

United States of America owns an undivided $\frac{2}{3}$ rd fee mineral interest in the above described 70-acre tract.

Township 9 North, Range 13 West

OK 4. Section 13: E $\frac{1}{2}$ SW $\frac{1}{4}$ (80 acres)

United States of America owns 100% fee mineral interest in the above described 80-acre tract.

5. Section 24: Lots 1 and 2 Less and Except the North 45.15 acres and all accretion and riparian rights appurtenant thereto, Lot 8 and all accretion and riparian rights appurtenant thereto, and the middle 0.90 acre of Lot 1 and the middle 4.25 acres of Lot 2. (70.60 acres)

Approx.
1/2

Need M. &
52.60%
MI

United States of America owns an undivided $\frac{111}{211}$ th fee mineral interest in the above described 70.60-acre tract.

The following is a summary of the stipulations that apply to the five tracts described above:

- Tract No. 1(a) General Stipulations and Special Stipulations
- Tract No. 1(b) Form GP-135 Special Stipulations
- Tract No. 2 General Stipulations and Special Stipulations
- Tract No. 3 General Stipulations and Special Stipulations
- Tract No. 4 Form GP-135 Special Stipulations
- Tract No. 5 General Stipulations and Special Stipulations

We have enclosed a copy of the three referenced stipulations. If you have any questions or need additional information, please contact Mr. Mike Berggren at 405-470-4824.

Sincerely,



Jeff Tompkins, Supervisor
Land Resources Group

Enclosures: (3)

cc: Ms. Jennifer E. Krieg
Reagan Smith Energy Solutions, Inc.
2525 NW Expressway, Suite 312
Oklahoma City, Oklahoma 73112
(w/enclosures)

Mr. Rod Smith, Superintendent
Oklahoma Department of Wildlife Conservation
19333 State Highway 49
Lawton, Oklahoma 73507-6015
(w/enclosures)

Mr. Quintin Opitz, District Manager
Fort Cobb Reservoir Master Conservancy District
Post Office Box 40
Anadarko, Oklahoma 73005
(w/enclosures)

GENERAL STIPULATIONS

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

*FORT COBB DAM AND RESERVOIR
FORT COBB DIVISION, WASHITA BASIN PROJECT, OKLAHOMA*

All rights under this lease/license are subordinate to the right of the United States to flood and submerge the lands, permanently or intermittently, in connection with the construction and operation and maintenance of the Fort Cobb Dam and Reservoir, Fort Cobb Division, Washita Basin Project, Oklahoma (Project lands).

All surface work performed by the Lessee/Licensee its contractors and assigns on the Fort Cobb Reservoir lands shall be under the general supervision of the Area Manager, Bureau of Reclamation in direct charge of the project, and shall be subject to such conditions and regulations as he/she may prescribe. Detailed plans and location for all structures, appurtenances thereto, and surface disturbance work on project lands shall be submitted to the said Area Manager for approval in advance of commencement of any surface work on the said project lands. At least 60 days or more lead time is preferred. Authorized representatives of Reclamation shall have the right to enter on the leased premises at any time to inspect both the installation and operational activities of the Lessee/Licensee.

A. Pre-drilling Conditions:

1. No exploratory drilling, flow line trenching or site clearing will occur until approval is granted by the appropriate Reclamation representatives in consultation with the local managing agency(s).
2. No wellhead shall be below the top of flood control pool elevation of 1354.8 feet, mean sea level. (This elevation restriction does not apply to areas downstream of the dam.) No drilling will be allowed within 400 feet of any developed recreation area.
3. All storage tanks shall be constructed above elevation 1374.4 feet, mean sea level (maximum water surface). This elevation restriction does not apply to areas downstream of the dam. Berms shall be constructed around storage batteries, tanks, and separators to contain their entire volume should an accidental spill or rupture occur.
4. Drilling a well for oil and gas is prohibited within 2,000 feet of any dam, dike, or other major structure, unless otherwise approved by the Area Manager in consultation with the local managing agency(s).
5. No well shall be drilled within 1/8 mile (660 feet) of a river, channel, permanent stream, tributary, or marsh site unless otherwise approved by the Area Manager in consultation with the local

managing agency(s). To protect watersheds, slopes in excess of 40 percent (2.5:1) should be avoided where possible.

6. All drilling operations shall be conducted in accordance with the applicable State laws relative to municipal water supplies.

7. No surface disturbance shall occur until completion of an environmental analysis of the proposed drilling activity by Reclamation and all coordination matters are completed. This analysis will include review of federally listed threatened and endangered plant and animal species, protection of wetlands, cultural resources, and water quality concerns. Certain data needs may be requested from the applicant proposing a surface disturbance action.

8. Where surface operations and facilities could reasonably be expected to discharge petroleum products into navigable waters and should oil or petroleum products be stored on site and facilities have an aggregate storage of 1,320 gallons or more or single containers with capacity of 660 gallons or more, a "Spill Prevention Control and Counter Measure Plan" shall be prepared and must be maintained and kept available for inspection on site (if manned) or at the nearest field office if unmanned. In the event of a spill or leakage, the Lessee/Licensee assumes all responsibility for cleanup and damages.

9. At Lessee/Licensee's expense, a cultural resource survey of lands that may be disturbed must be completed prior to any surface disturbance. If during construction, operation, and/or maintenance of any facility authorized by Reclamation Lessee/Licensee or any person working in its behalf discovers any historic or prehistoric grave, ruin, monument, or any object subject to the National Historic Preservation Act of 1966, the Archeological Resource Protection Act of 1979, or the Native American Graves Protection Act of 1992 and/or, Reclamation Instructions 376.11, work shall be suspended immediately and the discovery reported to Reclamation. When directed by Reclamation, the Lessee/Licensee shall obtain, at his expense, a qualified archeologist to examine and evaluate, and if necessary, excavate the discovery.

10. No "mud pits" shall be constructed on Federally-owned land. A closed mud system is required with containerization of drill cuttings. Water or discharge of any kind shall not be allowed to enter any drainage. All unattended containers containing liquids shall be fenced.

11. The derrick shall not be located closer than one and one-half times its height from any electrical power transmission lines unless prior approval is obtained from the owner of the power company. Signs shall be posted warning the public to prevent entry to the job site. Also, adequate blowout preventers shall be properly maintained

12. All aboveground structures, not subject to applicable safety requirements, shall be painted to blend with the natural surroundings. The paint used shall be lusterless, nonreflective, flat, or semi-gloss color that blends with the area

1. The Lessee/Licensee shall observe the following restrictions during exploration:

a. Wherever possible, existing roads and trails are to be used as access to the drilling site. New road construction will be kept to a minimum and new construction will not begin until the location is approved by the local managing agency(s).

b. If existing roads are used, Licensee/Lessee agrees to maintain such roads in a condition equal to or greater than the existing condition. If any existing roads are open to public use, such public use will be allowed to continue and not be adversely affected by the activities of the Licensee/Lessee. Any new roads constructed by the License/Lessee shall be closed to the public.

c. New access roads shall normally be a maximum of 30 feet wide including drainage ditches and culverts. Road surface shall be graveled to a thickness identified as suitable for the existing ground. Access roads shall be constructed to widths suitable for the safe operation of the vehicles and equipment at proposed speeds. The road speeds shall be posted with signs and maximum speed limit signs. Speeds shall be limited on curves and posted to speeds that will permit a vehicle to be stopped within one-half the minimum sight distance. The road shall be maintained in safe condition.

d. Cleared trees and shrubs will be removed and/or piled as brush piles for wildlife shelter as designated by the local managing agency(s). Available topsoil will be removed from the road right-of-way and stored in a topsoil stockpile.

e. If the local managing agency(s), requests Lessee/Licensee shall construct cattle guards or install gates with locks on new access roads which will be maintained by the Lessee/Licensee during drilling operations and all such times thereafter as production continues. Fencing of roads may be required.

f. Roads shall be maintained in suitable condition for vehicle passage during the duration of drilling activities with special consideration given to erosion control during wet and muddy periods.

g. Existing roads shall be returned to original or equivalent condition after drilling equipment has been removed.

h. All roads shall be adequately drained to control runoff and soil erosion. Drainage facilities may include ditches, water bars, culverts, and/or any other measures deemed necessary by Reclamation representatives. The following is a general guide for the spacing of water bars:

<u>Present Slope</u>	
less than 2 percent.....	200 feet
2 to 4 percent.....	100 feet

4 to 5 percent.....	75 feet
more than 5 percent.....	50 feet

i. Each existing fence to be crossed by Lessee/Licensee shall be braced and tied off before cutting so as to prevent slacking of the wire. The opening shall be gated during construction and /or well operation. Upon abandonment of the site, the gate shall be moved and the fence restored to its original condition.

2. Lessee/Licensee shall observe the following stipulations should oil or gas be found and production activities occur:

a. If existing roads are used, Licensee/Lessee agrees to maintain such roads in a condition equal to or greater than the existing condition . If any existing roads are open to public use, such public use will be allowed to continue and not be adversely affected by the activities of the Licensee/Lessee. Any new roads constructed by the License/Lessee shall be closed to the public.

b. Should the local managing agency deem it necessary to control vehicle traffic into the area during any season of the year, the production company will provide a metal gate and lock.

3. Upon abandonment of the site, any new road construction sites will be revegetated, by the drilling company, with native and/or adapted grasses, forbs, and shrubs as approved by Reclamation, unless the local managing agency(s) indicates in writing that the road is to remain. Revegetation is to be accomplished by seeding and fertilizing the area within 1 year of completion at recommended seeding rates and dates.

C. Drilling Pad and Reserve Pit, IF APPROVED BY RECLAMATION:

1. Area cleared for the drilling pad site and reserve pit shall be the absolute minimum required for operations.

2. All trees and shrubs removed from the pad site shall be piled near the site at places designated by the local managing agency(s) for use as wildlife shelters.

3. Available topsoil shall be removed from the drilling pad and pit site and stored in a topsoil stockpile.

4. Diesel fuel tanks and other potential pollution sources will be surrounded by an earthen berm of sufficient height to contain their entire volume in the event of an accidental leak or rupture.

5. The area will be kept well policed and free of trash and litter at all times, including access roads used solely by the Lessee/Licensee. Litter blown out of the work area must be picked up. All waste associated with the drilling operations shall be removed and deposited in an approved sanitary

landfill within 1 month after removal of the drilling rig. The Lessee/Licensee shall comply with all State laws and regulations pertaining to the disposal of human waste.

6. For the protection of livestock and wildlife, all containers containing toxic liquids shall be fenced and open containers shall be covered with a fine mesh netting (i.e., hardware cloth) with openings being of one-half inch or less.

7. The Lessee/Licensee will remove fluids and trash from the site. After drilling activities are completed the site shall be reshaped to original contours and covered with topsoil. This restoration must be accomplished within 90 days of completion of drilling. The area must then be revegetated as required by Reclamation.

D. Actions with a Producing Well:

1. A minimum service area will be developed around the well head. No permanent material storage will be allowed on the lease. The remainder of the drilling pad will be covered with topsoil from the stockpile and restored to vegetation by tilling, fertilizing, and seeding. Specific seed types will be determined on a case-by-case basis by Reclamation in consultation with the local managing agency(s).

2. The Lessee/Licensee may be required to utilize electric or submersible pumps, where feasible, rather than fuel-powered pumps (or other machinery). All electric lines must be buried to a depth of 15-18 inches.

3. All transfer lines from well site to tank battery, saltwater disposal well, or the like, must be buried 4 feet below the surface and a minimum depth of 4 feet at stream, creek, and river channel crossings.

4. When possible, a common point of collection shall be established to minimize the number of tank batteries.

E. Actions with a Non-producing Well:

1. All disturbed areas will be recontoured, covered with topsoil, and revegetated as approved by Reclamation. All trash will be removed from the lease site.

2. Gates and cattle guards shall be removed where requested by the local managing agency(s). Any openings in fences will be restored to original condition.

F. General

1. The Lessee/Licensee shall limit access to well and storage locations on project lands to authorized personnel.

2. The Lessee/Licensee agrees to cease all operations and make all necessary corrections to the satisfaction of the representative of Reclamation in consultation with the local managing agency(s) before resuming any operations should any violations of the terms of this license occur.

3. The Lessee/Licensee shall not permit any nuisance to be maintained on the premises and shall not use said premises for any purposes other than those authorized in the licenses. Before abandoning any well, the Lessee/Licensee shall securely plug the same so as to effectually shut off water from the oil-bearing stratum.

4. The Lessee/Licensee shall carry on the development and/or operation of the premises in a workmanlike manner and shall not commit or suffer to be committed waste upon the lands in his occupancy and use. In drilling operations, the Lessee/Licensee shall only use so much of the land as is necessary; shall safeguard the lakes and streams from any pollution; and shall not permit oil, saltwater, drilling mud, or other deleterious substances to escape onto the land, but the same shall be retained in proper tanks, receptacles, or in pits prepared for such purposes; and after the termination of drilling operations, the land will be properly restored to its original condition, and only so much thereof shall be used in the production of the leased premises as is reasonably necessary to operate any well or wells thereon.

5. Lessee/Licensee shall provide all subcontractors and assigns, especially the dirt contractor, with a copy of the above stipulations prior to construction of the road, pad, or associated developments.

G. Hunting:

1. Lessee/Licensee activities should not prevent hunters and other consumptive and nonconsumptive users of the wildlife resources from freely pursuing their activities in the wildlife management area. Lessee/Licensee activities should be conducted to minimize conflict with public users of recreational areas.

2. Lessee/Licensee will not be permitted to carry firearms or other hunting or trapping equipment unless the equipment is appropriate to a season open on the designated areas at the time and the individual(s) area authorized to hunt.

3 During deer and turkey season, delivery and trucking to and from well sites in the wildlife management area will be avoided to the maximum extent possible for the 2-hour period immediately after sunrise and for the 2-hour period immediately before sunset. Additionally, no new exploration work or exploratory drilling may be initiated during the deer and turkey season unless special approval is obtained from Reclamation in consultation with the surface managing agency. Other timing restrictions may be established as needed to protect the project.

Date

Signature of Lessee/Licensee

SPECIAL STIPULATION - BUREAU OF RECLAMATION

To avoid interference with recreation development and/or impacts to fish and wildlife habitat and to assist in preventing damage to any Bureau of Reclamation dams, reservoirs, canals, ditches, laterals, tunnels, and related facilities, and contamination of the water supply therein, the lessee agrees that the following conditions shall apply to all exploration and developmental activities and other operation of the works thereafter on lands covered by this lease hereinafter referred to as the "leased area":

1. Prior to commencement of any surface-disturbing work including drilling, access road work, and well location construction, a surface use and operations plan will be filed with the appropriate officials. A copy of this plan will be furnished to the Area Manager Oklahoma-Texas Area Office, Great Plains Region, Bureau of Reclamation, 5924 NW 2nd Street, Suite 200, Oklahoma City, Oklahoma 73127 for review and consent prior to approval of the plan. Such approval will be conditioned on reasonable requirements needed to prevent soil erosion, water pollution, and unnecessary damages to the surface vegetation and other resources, including cultural resources, of the United States, its lessees, permittees, or licensees, and to provide for the restoration of the land surface use and vegetation. The plan shall contain provisions as the Bureau of Reclamation may deem necessary to maintain proper management of the water, recreation, lands, structures, and resources, including cultural resources, within the prospecting, drilling, or construction area.

Drilling sites for all wells and associated investigations such as seismograph work shall be included in the above-mentioned surface use and operation plan.

If later explorations require departure from, or additions to the approved plan, these revisions or amendments, together with a justification statement for proposed revisions, will be submitted for approval to the Area Manager, Oklahoma-Texas Area Office, Bureau of Reclamation, or his/her authorized representative.

Any operations conducted in advance of approval of an original, revised, or amended prospecting plan, or which are not in accordance with an approved plan, constitute a violation of the terms of this lease. The Bureau of Reclamation reserves the right to close down operations until such corrective action, as is deemed necessary, is taken by the lessee.

2. No occupancy of the surface of the following excluded areas is authorized by this lease. It is understood and agreed that protection of these areas is necessary for the operation and maintenance of Congressionally authorized Bureau of Reclamation projects. The excluded areas are:

- a. Within 500 feet on either side of the centerline of any and all roads or highways within the leased area.
- b. Within 200 feet on either side of the centerline of any and all trails within the leased area.

- c. Within 500 feet of the normal high-water line of any and all live streams in the leased area.
- d. Within 400 feet of any and all recreation developments within the leased area.
- e. Within 400 feet of any improvements either owned, permitted, leased, or otherwise authorized by the Bureau of Reclamation within the leased area.
- f. Within 200 feet of established crop fields, food plots, and tree/shrub plantings within the leased area.
- g. Within 200 feet of slopes steeper than a 2:1 gradient within the leased area.
- h. Within established rights-of-way of canals, laterals, and drainage ditches within the leased area.
- i. Within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater, for irrigation facilities without clearly marked rights-of-way within the leased area.

3. No occupancy of the surface or surface drilling will be allowed in the following areas. In addition, no directional drilling will be allowed that would intersect the subsurface zones delineated by a vertical plane in these areas. The areas are:

- a. At or below the top of the flood control pool as defined in the Standard Operating Procedures (SOP), of any reservoirs and related facilities located within the leased area.
- b. Within 2,000 feet of dam embankments and appurtenance structures such as spillway structures, outlet works, etc.
- c. Within one-half ($\frac{1}{2}$) mile horizontal from the centerline of any tunnel within the leased area.

- d. Within the surcharge pool as defined in the Standard Operating Procedures (SOP), of any reservoirs and related facilities located within the leased area. **This restriction only applies to mineral tracts where the United States owns 100% of the fee mineral interest.**

4. The distances stated in items 2 and 3 above are intended to be general indicators only. The Bureau of Reclamation reserves the right to revise these distances as needed to protect Bureau of Reclamation facilities, land, and water areas.

5. Mineral activities at all Great Plains Region projects under the jurisdiction of the Oklahoma-Texas Area Office (OTAO) are also subject to additional "General Stipulations" for each OTAO project. Whenever there is a conflict between this "Special Stipulation" and an OTAO project's "General Stipulations", the stronger stipulation shall apply.

6. The use of explosives in any manner shall be so controlled that the works and facilities of the United States, its successors and assigns, will in no way be endangered or damaged. In this connection, an explosives use plan shall be submitted to, and approved by, the Area Manager, Oklahoma-Texas Office, Bureau of Reclamation, or his authorized representative.

7. The lessee shall be liable for all damage to the property of the United States, its successors and assigns, resulting from the exploration, development, or operation of the works contemplated by this lease, and shall further hold the United States, its successors and assigns, and its officers, agents, and employees, harmless from all claims of third parties for injury or damage sustained, or in any way resulting from, the exercise of the rights and privileges conferred by this lease.

8. In addition to any other bond required under the provisions of this lease, the lessee shall provide such bond as the United States may at any time require for damages which may arise under the liability provisions of sections six (6) and seven (7) above.

Date

Signature of Lessee

Special Stipulations

I. The following stipulations apply to drilling within the Fort Cobb Wildlife Management Area, Fort Cobb Reservoir, Oklahoma:

1. Leasing for pooling purposes only (i.e., no surface occupancy) will be allowed within the Federal boundaries of the Fort Cobb Reservoir in:

a. Township 9 North, Range 13 West, Sections 13, 23, and 24 - This area is critical swamp rabbit habitat and a future waterfowl management area. Also, much of this area contains riparian timber.

b. Township 9 North, Range 12 West, Section 32 and SE¼ of SE¼ Section 30 - This area is the most important crow wintering areas in the nation.

2. No wells shall be drilled within 1/8 mile (660 feet) of intermittent streams to further protect riparian timber.

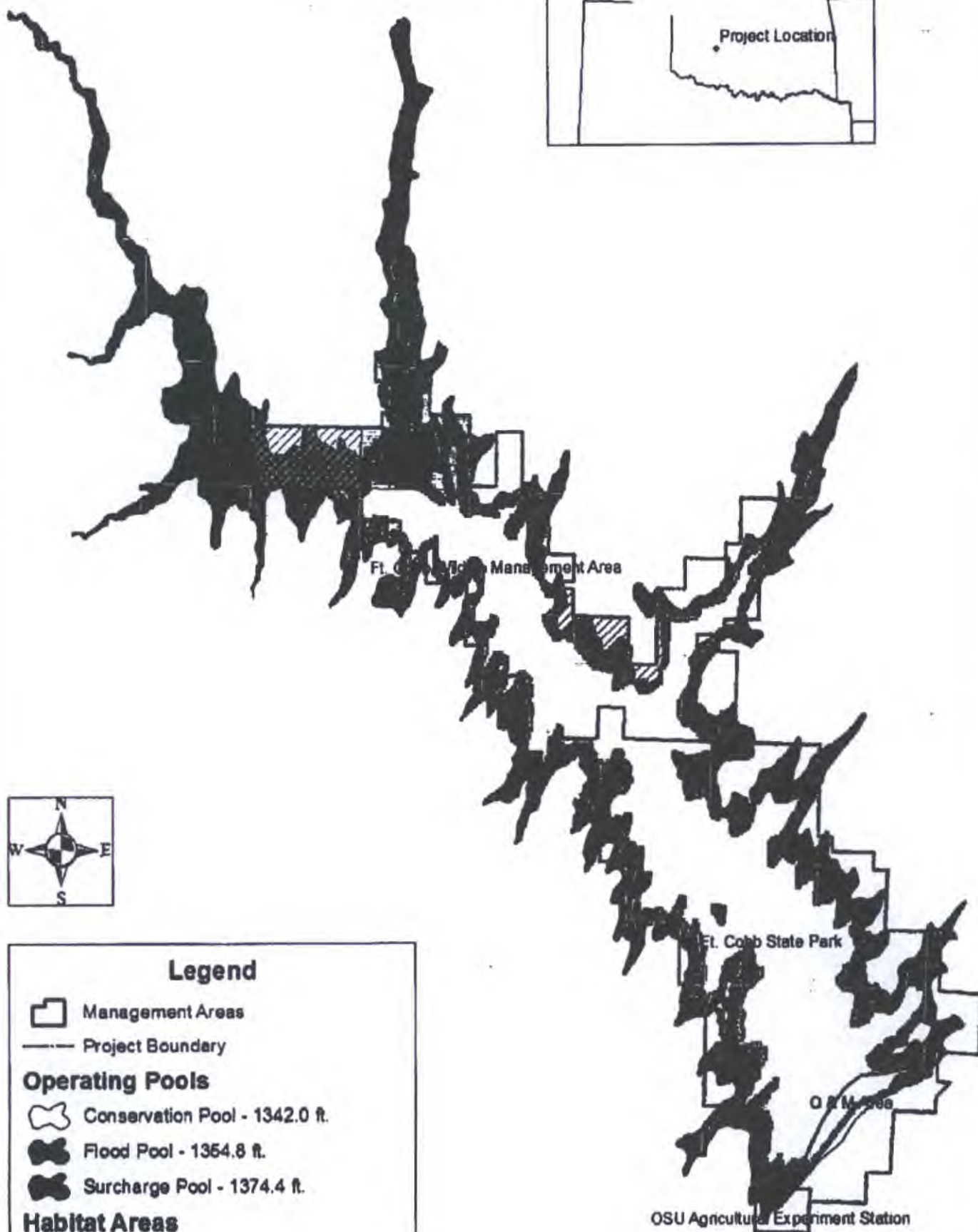
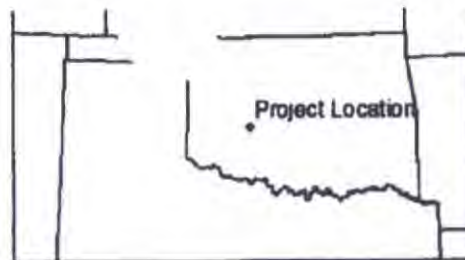
3. All equipment must be powered with electric motors to minimize impacts on recreational use.

II. The following stipulations apply to drilling within the Fort Cobb State Park, Fort Cobb Reservoir, Oklahoma:

1. Township 5 North, Range 20 West, Section 22 and the SW¼ of Section 15—This is a highly developed recreation area.

2. Any producing well within 1,500 feet of any campsite or sleeping quarters must be powered with an electric motor.

3. A 5-foot cyclone fence with two strands of barbed wire on top must be constructed around any well in production.



Legend

- Management Areas
- Project Boundary

Operating Pools

- Conservation Pool - 1342.0 ft.
- Flood Pool - 1354.8 ft.
- Surcharge Pool - 1374.4 ft.

Habitat Areas

- Crow Roost
- Potential Waterfowl Management Area
- Swamp Rabbit Habitat





BUREAU OF LAND MANAGEMENT CASE RECORDATION (LIVE) SERIAL REGISTER PAGE

Run Date/Time: 11/09/16 12:37 PM

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01 02-25-1920;041STAT0437;30USC181ETSEQ

Case Type 311211: O&G LSE SIMO PUBLIC LAND

Commodity 459: OIL & GAS

Case Disposition: (AUTHORIZED)

Case File Juris:

Total Acres
398.050

Serial Number
OKNM-- - 020396

Serial Number OKNM-- - 020396

Name & Address					Int Rel	%Interest
CHEVRON USA HOLDINGS INC	11111 S WILCREST	HOUSTON TX 77099	OPERATING RIGHTS	0 000000000		
CHEVRON USA INC	6301 DEAUVILLE	MIDLAND TX 797062964	OPERATING RIGHTS	0 000000000		
CHEVRON USA INC	6301 DEAUVILLE	MIDLAND TX 797062964	LESSEE	25 000000000		
DEVON ENERGY PROD CO LP	333 W SHERIDAN AVE	OKLAHOMA CITY OK 731025010	LESSEE	75 000000000		
NEWFIELD EXPL MID-CONTN INC	110 W 7TH ST #1300	TULSA OK 74119	OPERATING RIGHTS	0 000000000		
NORTEX CORP	1415 LOUISIANA #3100	HOUSTON TX 77002	OPERATING RIGHTS	0 000000000		

Mer Twp Rng Sec				SType	Nr Suff	Subdivision	District/Resource Area	County	Mgmt Agency
17	0100N	0080W	001	FF		L5 PLUS ACCR & RIPAR,	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO
17	0100N	0080W	001	FF		L5 PLUS ACCR & RIPAR,	OKLAHOMA FIELD OFFICE	GRADY	BUREAU OF LAND MGMT
17	0100N	0080W	002	FF		L1,2 PLUS ACCR & RIPAR,	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO
17	0100N	0080W	002	FF		L1,2 PLUS ACCR & RIPAR,	OKLAHOMA FIELD OFFICE	GRADY	BUREAU OF LAND MGMT
17	0110N	0080W	028	FF		L3,4 PLUS ACCR & RIPAR,	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO
17	0110N	0080W	028	FF		L3,4 PLUS ACCR & RIPAR,	OKLAHOMA FIELD OFFICE	CANADIAN	BUREAU OF LAND MGMT
17	0110N	0080W	035	FF		L1-4 PLUS ACCR & RIPAR,	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO
17	0110N	0080W	035	FF		L1-4 PLUS ACCR & RIPAR,	OKLAHOMA FIELD OFFICE	CANADIAN	BUREAU OF LAND MGMT

Serial Number: OKNM-- - 020396

Act Date	Code	Action	Action Remarks	Pending Office
12/25/1973	387	CASE ESTABLISHED	SPAR117,	
12/26/1973	888	DRAWING HELD		
03/22/1974	237	LEASE ISSUED		
04/01/1974	496	FUND CODE	05,145003	
04/01/1974	530	RLTY RATE - 12 1/2%		
04/01/1974	868	EFFECTIVE DATE		
02/16/1979	315	RENTAL RATE DET/ADJ	\$2.00,	
03/01/1981	246	LEASE COMMITTED TO CA	SCR197	
08/30/1981	660	MEMO OF 1ST PROD-ALLOC	/1/SCR197	
12/22/1981	643	PRODUCTION DETERMINATION	/1/FIRST	
12/28/1981	102	NOTICE SENT-PROD STATUS		
07/27/1982	246	LEASE COMMITTED TO CA	OKNM74733	
07/27/1982	501	REFERENCE NUMBER	CA-C40T073,	
07/27/1982	651	HELD BY PROD - ALLOCATED	OKNM74733	
07/27/1982	660	MEMO OF 1ST PROD-ALLOC	/2/OKNM74733	
10/05/1982	932	TRF OPER RGTS FILED		
11/08/1982	932	TRF OPER RGTS FILED		
12/22/1982	643	PRODUCTION DETERMINATION	/2/FIRST	
04/13/1983	933	TRF OPER RGTS APPROVED	EFF 11/01/83;	
04/13/1983	933	TRF OPER RGTS APPROVED	EFF 12/01/83,	
02/04/1986	140	ASGN FILED	MTS/MESA-TEXACO	
02/04/1986	932	TRF OPER RGTS FILED		
02/10/1986	932	TRF OPER RGTS FILED		

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**BUREAU OF LAND MANAGEMENT
CASE RECORDATION
(LIVE) SERIAL REGISTER PAGE**

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03/20/1986	140	ASGN FILED	MTS/MESA-TEXACO
03/20/1986	932	TRF OPER RGTS FILED	
03/25/1986	139	ASGN APPROVED	EFF 03/01/86,
03/25/1986	139	ASGN APPROVED	EFF 04/01/86,
03/25/1986	933	TRF OPER RGTS APPROVED	(1)EFF 03/01/86,
03/25/1986	933	TRF OPER RGTS APPROVED	(2)EFF 03/01/86,
03/25/1986	933	TRF OPER RGTS APPROVED	(3)EFF 03/01/86;
03/25/1986	933	TRF OPER RGTS APPROVED	(4)EFF 03/01/86;
03/27/1986	963	CASE MICROFILMED/SCANNED	CNUM 101,083 EPR
02/03/1987	932	TRF OPER RGTS FILED	
04/28/1988	933	TRF OPER RGTS APPROVED	(1)EFF 03/01/88;
04/28/1988	933	TRF OPER RGTS APPROVED	(2)EFF 03/01/88,
07/05/1988	974	AUTOMATED RECORD VERIF	PR/GO
05/01/1990	647	MEMO OF LAST PROD-ALLOC	/3/SCR197
05/21/1990	643	PRODUCTION DETERMINATION	/3/LAST
05/31/1990	522	CA TERMINATED	SCR197
03/20/1991	140	ASGN FILED	MESA/SEAGULL MIDCON
03/20/1991	932	TRF OPER RGTS FILED	MESA/SEAGULL MIDCON
05/10/1991	139	ASGN APPROVED	EFF 04/01/91,
05/10/1991	933	TRF OPER RGTS APPROVED	EFF 04/01/91,
05/10/1991	974	AUTOMATED RECORD VERIF	MRR/CG
09/17/1991	140	ASGN FILED	TEXACO/TEXACO EXPL
09/23/1991	932	TRF OPER RGTS FILED	TEXACO/TEXACO EXPL
12/05/1991	139	ASGN APPROVED	EFF 12/01/91;
12/05/1991	974	AUTOMATED RECORD VERIF	AR/JG
01/02/1992	933	TRF OPER RGTS APPROVED	EFF 10/01/91,
01/02/1992	974	AUTOMATED RECORD VERIF	BTM/JG
01/27/1992	932	TRF OPER RGTS FILED	TEXACO/NORTECH CORP
04/13/1992	933	TRF OPER RGTS APPROVED	EFF 02/01/91,
04/13/1992	974	AUTOMATED RECORD VERIF	TF/JS
09/16/1992	974	AUTOMATED RECORD VERIF	ST/JS
11/10/1998	817	MERGER RECOGNIZED	SEAGULL/SEAGULL E&P
04/23/1999	932	TRF OPER RGTS FILED	PHILLIPS/LARIAT
06/09/1999	933	TRF OPER RGTS APPROVED	EFF 05/01/99,
06/09/1999	974	AUTOMATED RECORD VERIF	ANN
03/01/2001	817	MERGER RECOGNIZED	LARIATPETRO/NEWFIELD
03/01/2001	974	AUTOMATED RECORD VERIF	AT
05/30/2002	140	ASGN FILED	TEXACO EXPL & PROD,1
05/30/2002	932	TRF OPER RGTS FILED	TEXACO EXPL & PROD,1
06/27/2002	139	ASGN APPROVED	EFF 06/01/02,
06/27/2002	933	TRF OPER RGTS APPROVED	EFF 06/01/02,
06/27/2002	974	AUTOMATED RECORD VERIF	JLV
09/09/2002	940	NAME CHANGE RECOGNIZED	SEAGULL/OCEAN ENE
08/14/2003	940	NAME CHANGE RECOGNIZED	OCEAN ENE/DEVON LA
03/08/2006	817	MERGER RECOGNIZED	DEVON LA/DEVON ENE
11/07/2006	940	NAME CHANGE RECOGNIZED	TEXACO EXPL/CHEVRON

Line Nr Remarks

Serial Number. OKNM-- - 020396

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**BUREAU OF LAND MANAGEMENT
CASE RECORDATION
(LIVE) SERIAL REGISTER PAGE**

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01 02-25-1920;041STAT0437;30USC181ETSEQ

Total Acres

Serial Number

Case Type 311211: O&G LSE SIMO PUBLIC LAND

325.240

OKNM-- - 028183

Commodity 459: OIL & GAS

Case Disposition: AUTHORIZED

Case File Juris:

Serial Number: OKNM-- - 028183

Name & Address			Int Rel	%Interest
CHEVRON USA HOLDINGS INC	11111 S WILCREST	HOUSTON TX 77099	OPERATING RIGHTS	0.000000000
CHEVRON USA INC	6301 DEAUVILLE	MIDLAND TX 797062964	OPERATING RIGHTS	0.000000000
CHEVRON USA INC	6301 DEAUVILLE	MIDLAND TX 797062964	LESSEE	25.000000000
DEVON ENERGY PROD CO LP	333 W SHERIDAN AVE	OKLAHOMA CITY OK 731025010	LESSEE	75.000000000
NEWFIELD EXPL MID-CONTN INC	110 W 7TH ST #1300	TULSA OK 74119	OPERATING RIGHTS	0.000000000
NORTEX CORP	1415 LOUISIANA #3100	HOUSTON TX 77002	OPERATING RIGHTS	0.000000000

Serial Number: OKNM-- - 028183

Mer Twp	Rng	Sec	SType	Nr	Suff	Subdivision	District/Resource Area	County	Mgmt Agency
17	0100N	0080W	001	LOTS		5;	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO
17	0100N	0080W	002	FF		REMAINDER OF LOT 2;(M&B)	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO
17	0100N	0080W	002	FF		REMAINDER OF LOT 2;(M&B)	OKLAHOMA FIELD OFFICE	GRADY	BUREAU OF LAND MGMT
17	0100N	0080W	002	LOTS		1,3;	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO
17	0110N	0080W	028	ALIQ		NESE;	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO
17	0110N	0080W	028	FF		REMAINDER OF LOT 3;(M&B)	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO
17	0110N	0080W	028	FF		REMAINDER OF LOT 3;(M&B)	OKLAHOMA FIELD OFFICE	CANADIAN	BUREAU OF LAND MGMT
17	0110N	0080W	028	FF	02	REMAINDER OF THE SWNE;MB	OKLAHOMA FIELD OFFICE	CANADIAN	BUREAU OF LAND MGMT
17	0110N	0080W	028	FF	02	REMAINDER OF THE SWNE;MB	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO
17	0110N	0080W	028	LOTS		4;	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO
17	0110N	0080W	035	FF	01	REMAINDER OF LOT 2;(M&B)	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO
17	0110N	0080W	035	FF	01	REMAINDER OF LOT 2;(M&B)	OKLAHOMA FIELD OFFICE	CANADIAN	BUREAU OF LAND MGMT
17	0110N	0080W	035	FF	02	REMAINDER OF LOT 3&4;M&B	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO
17	0110N	0080W	035	FF	02	REMAINDER OF LOT 3&4;M&B	OKLAHOMA FIELD OFFICE	CANADIAN	BUREAU OF LAND MGMT
17	0110N	0080W	035	LOTS		1;	OKLAHOMA FIELD OFFICE	CANADIAN	CHEYENNE AND ARAPAHO

Serial Number: OKNM-- - 028183

Act Date	Code	Action	Action Remarks	Pending Office
04/25/1976	387	CASE ESTABLISHED	SPAR699;	
04/26/1976	888	DRAWING HELD		
08/10/1976	237	LEASE ISSUED		
09/01/1976	496	FUND CODE	05;145003	
09/01/1976	530	RLTY RATE - 12 1/2%		
09/01/1976	868	EFFECTIVE DATE		
02/16/1979	315	RENTAL RATE DET/ADJ	\$2.00;	
03/01/1981	246	LEASE COMMITTED TO CA	SCR197	
08/30/1981	660	MEMO OF 1ST PROD-ALLOC	/1/SCR197	
12/22/1981	643	PRODUCTION DETERMINATION	/1/FIRST	
07/27/1982	246	LEASE COMMITTED TO CA	OKNM74733	
07/27/1982	501	REFERENCE NUMBER	CA-C40T073;	
07/27/1982	651	HELD BY PROD - ALLOCATED	OKNM74733	
07/27/1982	660	MEMO OF 1ST PROD-ALLOC	/2/OKNM74733	
10/05/1982	932	TRF OPER RGTS FILED		
11/08/1982	932	TRF OPER RGTS FILED		
12/22/1982	643	PRODUCTION DETERMINATION	/2/FIRST	

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**BUREAU OF LAND MANAGEMENT
CASE RECORDATION
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04/13/1983	933	TRF OPER RGTS APPROVED	EFF 11/01/82,
04/13/1983	933	TRF OPER RGTS APPROVED	EFF 12/01/82,
02/04/1986	140	ASGN FILED	MTS/ MESA ET AL
02/04/1986	932	TRF OPER RGTS FILED	
02/10/1986	932	TRF OPER RGTS FILED	
03/20/1986	140	ASGN FILED	MESA/MESA OPER
03/20/1986	932	TRF OPER RGTS FILED	
03/25/1986	139	ASGN APPROVED	(1)EFF 04/01/86;
03/25/1986	139	ASGN APPROVED	(2)EFF 04/01/86;
03/25/1986	933	TRF OPER RGTS APPROVED	(1)EFF 04/01/86;
03/25/1986	933	TRF OPER RGTS APPROVED	(2)EFF 04/01/86;
03/25/1986	933	TRF OPER RGTS APPROVED	(3)EFF 04/01/86;
03/27/1986	963	CASE MICROFILMED/SCANNED	CNUM 104,716 EPR
02/03/1987	932	TRF OPER RGTS FILED	
03/11/1987	933	TRF OPER RGTS APPROVED	EFF 03/01/87,
07/06/1988	974	AUTOMATED RECORD VERIF	AR/LO
05/01/1990	647	MEMO OF LAST PROD-ALLOC	/3/SCR197
05/21/1990	643	PRODUCTION DETERMINATION	/3/LAST
05/31/1990	522	CA TERMINATED	SCR197
03/20/1991	140	ASGN FILED	MESA/SEAGULL MIDCON
03/20/1991	932	TRF OPER RGTS FILED	MESA/SEAGULL MIDCON
05/10/1991	139	ASGN APPROVED	EFF 04/01/91,
05/10/1991	933	TRF OPER RGTS APPROVED	EFF 04/01/91,
05/10/1991	974	AUTOMATED RECORD VERIF	MRR/CG
09/17/1991	140	ASGN FILED	TEXACO INC/EXPL
09/23/1991	932	TRF OPER RGTS FILED	TEXACO INC/EXPL
12/05/1991	139	ASGN APPROVED	EFF 10/01/91,
12/05/1991	974	AUTOMATED RECORD VERIF	AR/JG
01/03/1992	933	TRF OPER RGTS APPROVED	EFF 10/01/91,
01/03/1992	974	AUTOMATED RECORD VERIF	BTM/JG
01/27/1992	932	TRF OPER RGTS FILED	TEXACO/NORTEX CORP
04/13/1992	933	TRF OPER RGTS APPROVED	EFF 02/01/92;
04/13/1992	974	AUTOMATED RECORD VERIF	TF/JS
09/16/1992	974	AUTOMATED RECORD VERIF	ST/JS
11/10/1998	817	MERGER RECOGNIZED	SEAGULL/SEAGULL E&P
04/23/1999	932	TRF OPER RGTS FILED	PHILLIPS/LARIAT
06/16/1999	933	TRF OPER RGTS APPROVED	EFF 05/01/99,
06/16/1999	974	AUTOMATED RECORD VERIF	ANN
03/01/2001	817	MERGER RECOGNIZED	LARIATPETRO/NEWFIELD
03/01/2001	974	AUTOMATED RECORD VERIF	AT
05/30/2002	140	ASGN FILED	TEXACO EXPL & PROD,1
05/30/2002	932	TRF OPER RGTS FILED	TEXACO EXPL & PROD,1
06/27/2002	139	ASGN APPROVED	EFF 06/01/02,
06/27/2002	933	TRF OPER RGTS APPROVED	EFF 06/01/02,
06/27/2002	974	AUTOMATED RECORD VERIF	JLV
09/09/2002	940	NAME CHANGE RECOGNIZED	SEAGULL/OCEAN ENE
08/14/2003	940	NAME CHANGE RECOGNIZED	OCEAN ENE/DEVON LA
03/08/2006	817	MERGER RECOGNIZED	DEVON LA/DEVON ENE
11/07/2006	940	NAME CHANGE RECOGNIZED	TEXACO EXPL/CHEVRON

Line Nr Remarks

Serial Number. OKNM-- - 028183

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643
658 # Number / NAME
650

Form 3160-4
(August 2007)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: July 31, 2010

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

5. Lease Serial No.
OKNM20396

1a. Type of Well <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Dry <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name	
b. Type of Completion <input checked="" type="checkbox"/> New Well <input type="checkbox"/> Work Over <input type="checkbox"/> Deepen <input type="checkbox"/> Plug Back <input type="checkbox"/> Diff. Resvr. Other _____		7. Unit or CA Agreement Name and No.	
2. Name of Operator CIMAREX ENERGY CO. Contact: SHELI ARMSTRONG E-Mail: sarmstrong@cimarex.com		8. Lease Name and Well No. HINES FEDERAL 1H-0235X	
3. Address 202 S. CHEYENNE AVE, SUITE 1000 TULSA, OK 74103		9. API Well No. 35-051-24117	
4. Location of Well (Report location clearly and in accordance with Federal requirements)* Sec 2 T10N R08W Mer At surface SWSE 235FSL 2410FEL 35.363940 N Lat, 98.015700 W Lon Sec 2 T10N R08W Mer At top prod interval reported below SWSE 235FSL 2410FEL 35.363940 N Lat, 98.015700 W Lon Sec 35 T11N R08W Mer At total depth NWNE 166FNL 1674FEL 35.391244 N Lat, 98.013266 W Lon		10. Field and Pool, or Exploratory WOODFORD	
14. Date Spudded 04/26/2017		15. Date T.D. Reached 06/07/2017	
16. Date Completed <input type="checkbox"/> D & A <input checked="" type="checkbox"/> Ready to Prod. 08/26/2017		17. Elevations (DF, KB, RT, GL)* 1278 GL	
18. Total Depth: MD 21634 TVD 11639		19. Plug Back T.D.: MD 21618 TVD 11640	
20. Depth Bridge Plug Set: MD TVD		21. Type Electric & Other Mechanical Logs Run (Submit copy of each) NONE	
22. Was well cored? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (Submit analysis) Was DST run? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (Submit analysis) Directional Survey? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (Submit analysis)			

23. Casing and Liner Record (Report all strings set in well)

Hole Size	Size/Grade	Wt. (#/ft.)	Top (MD)	Bottom (MD)	Stage Cementer Depth	No. of Sk. & Type of Cement	Slurry Vol. (BBL)	Cement Top*	Amount Pulled
17.500	13.375 J55	54.5	0	1509		960	1675	0	
12.250	9.625 HCL-80	40.0	0	10720		1166	2092	7070	
9.000	5.500 HCP-110	20.0	0	21634		3460	4617	7100	

24. Tubing Record

Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)

25. Producing Intervals

Formation	Top	Bottom	Perforated Interval	Size	No. Holes	Perf. Status
A) WOODFORD	12155	21608	12155 TO 21407	0.420	2071	OPEN
B)			21481 TO 21608	0.450	37	OPEN
C)						
D)						

26. Perforation Record

27. Acid, Fracture, Treatment, Cement Squeeze, Etc.

Depth Interval	Amount and Type of Material
12155 TO 21608	28,500,571 GALS FLUID AND 25,812,559# SAND

Adj Sp 1215
Eng SA 12/18/2017
Adj MF 9/15/18

28. Production - Interval A

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
08/28/2017	09/10/2017	24	→	496.0	3633.0	1919.0	53.2		FLOWS FROM WELL
Choke Size	Thg. Press. Flwg. SI	Csg. Press. SI	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas Oil Ratio	Well Status	
23/64		3149.0	→	496	3633	1919	7324	POW	

28a. Production - Interval B

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
			→						
Choke Size	Thg. Press. Flwg. SI	Csg. Press. SI	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas Oil Ratio	Well Status	
			→						

(See Instructions and spaces for additional data on reverse side)

ELECTRONIC SUBMISSION #389392 VERIFIED BY THE BLM WELL INFORMATION SYSTEM

** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED **

28b Production - Interval C

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr API	Gas Gravity	Production Method
			→						
Choke Size	Tbg Press Flwg SI	Csg Press	24 Hr Rate	Oil BBL	Gas MCF	Water BBL	Gas Oil Ratio	Well Status	
			→						

28c Production - Interval D

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr API	Gas Gravity	Production Method
			→						
Choke Size	Tbg Press Flwg SI	Csg Press	24 Hr Rate	Oil BBL	Gas MCF	Water BBL	Gas Oil Ratio	Well Status	
			→						

29 Disposition of Gas(Sold, used for fuel, vented, etc)
SOLD

30 Summary of Porous Zones (Include Aquifers)

Show all important zones of porosity and contents thereof. Cored intervals and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures and recoveries

31. Formation (Log) Markers

Formation	Top	Bottom	Descriptions, Contents, etc	Name	Top Meas Depth
				RED FORK INOLA ATOKA NOVI LIME CHESTER MERAMEC OSAGE WOODFORD	10346 10531 10632 10682 10764 11745 12044 12146

32 Additional remarks (include plugging procedure)

33 Circle enclosed attachments

- | | | | |
|--|-------------------|--------------|----------------------|
| 1 Electrical/Mechanical Logs (1 full set req'd) | 2 Geologic Report | 3 DST Report | 4 Directional Survey |
| 5 Sundry Notice for plugging and cement verification | 6 Core Analysis | 7 Other | |

34 I hereby certify that the foregoing and attached information is complete and correct as determined from all available records (see attached instructions).

Electronic Submission #389392 Verified by the BLM Well Information System
For CIMAREX ENERGY CO., sent to the Tulsa

Name (please print) SHELI ARMSTRONGTitle REGULATORY ANALYSTSignature (Electronic Submission)Date 09/22/2017

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction

**** ORIGINAL ** ORIGINAL ** ORIGINAL ** ORIGINAL ** ORIGINAL ** ORIGINAL ** ORIGINAL ****

CEMENTING REPORT

Form 1002C
Rev 2012

OKLAHOMA CORPORATION COMMISSION
Oil & Gas Conservation Division
Post Office Box 52000
Oklahoma City, Oklahoma 73152-2000
OAC 165 10-3-4(i)

API No

051-24117

This form shall be filed with the Completion Report, (Form 1002A) The signature on this statement must be that of qualified employees of the cementing company and operator to demonstrate compliance with OAC 165 10-3-4(i). It may be advisable to take a copy of this form to location when cementing work is performed.

TYPE OR USE BLACK INK ONLY

*Operator Cimarex Energy	OCC/OTC 21194
*Well Name/No. Hines Federal 1H-0235X	County Grady
*Location SW 1/4 SW 1/4 SW 1/4 SE 1/4 Sec 02 Twp 10N Rge 08W	

Cement Casing Data	Conductor Casing	Surface Casing	Alternative Casing	Intermediate Casing	Production String	Liner
Cementing Date		04/27/17				
*Size of Drill Bit (Inches)		17 1/2				
*Estimated % wash or hole enlargement used in calculations		50%				
*Size of Casing (Inches O.D.)		13 3/8				
*Top of Liner (if liner used) (ft.)		N/A				
*Setting Depth of Casing (ft.) from ground level		1,509				
Type of Cement (API Class)		15.85 Poz.C				
In first (lead) or only slurry						
In second slurry		C				
In third slurry		N/A				
Sacks of Cement Used		664				
In first (lead) or only slurry						
In second slurry		296				
In third slurry		N/A				
Vol of slurry pumped (Cu ft)(14 X15)		1,275				
In first (lead) or only slurry						
In second slurry		400				
In third slurry		N/A				
Calculated Annular Height of Cement behind pipe (ft)		1,509				
Cement left in pipe (ft)		85				

*Amount of Surface Casing Required (from Form 1000)	<u>1500</u> ft
---	----------------

*Was cement circulated to Ground Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Was Cement Staging Tool (DV Tool) used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	*Was Cement Bond Log run? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If so, Attach Copy) *If Yes, at what depth? _____ ft
---	--

CEMENTING COMPANY AND OPERATOR MUST COMPLY WITH THE INSTRUCTIONS ON REVERSE SIDE OF FORM

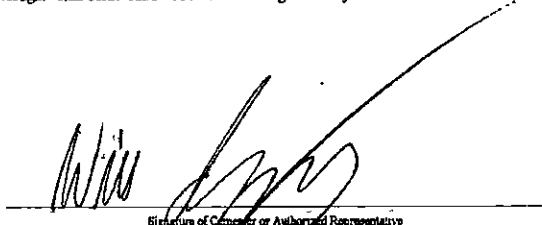
* Designates items to be completed by Operator
Items not so designated shall be completed by the Cementing Company.

Remarks

*Remarks

CEMENTING COMPANY

I declare under applicable Corporation Commission rule, that I am authorized to make certification, that the cementing of casing in this well as shown in the report facts presented on both sides on both sides of this form are true, correct and complete to the best of my knowledge. This certification covers cementing data only


Signature of Cementer or Authorized Representative

OPERATOR

I declare under applicable Corporation Commission rule, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct and complete to the best of my knowledge. This certification covers all well data and information presented herein


Signature of Operator or Authorized Representative

Name & Title (Printed or Typed)		William Tarpley	
Cementing Company		Schlumberger	
Address		560 W Jensen Rd.	
City		El Reno	
State	Oklahoma	Zip	73036
Telephone (AC) Number		405-422-8700	
Date		04/27/17	

Name & Title (Printed or Typed)		Kevin Martin	
Operator		Cimarex Energy	
Address		202 S Cheyenne, #1000	
City		Tulsa	
State	OK	Zip	74103
Telephone (AC) Number		918-585-1100	
Date		04/27/17	

INSTRUCTIONS

1. A) This form shall be filed by the operator, at the O.C.C. office in Oklahoma City, with the Completion Report (Form 1002A) for a producing well or a dry hole
 B) An original of this form shall be filed with the Completion Report, (Form 1002A), for each cementing company used on a well
 C) The cementing of different casing strings on a well by one cementing company may be consolidated on one form
- 2 Cementing Company and Operator shall comply with the applicable portions of OAC 165 10-3-4
3. Set surface casing 50 feet below depth of treatable water to be protected and cement from casing shoe to ground surface or as allowed by OAC 165:10-3-4

CEMENTING REPORT

Form 1002C
Rev. 2012

OKLAHOMA CORPORATION COMMISSION
Oil & Gas Conservation Division
Post Office Box 52000
Oklahoma City, Oklahoma 73152-2000
OAC 165-10-3-4(f)

API No
35051241170000

This form shall be filed with the Completion Report, (Form 1002A). The signature on this statement must be that of qualified employees of the cementing company and operator to demonstrate compliance with OAC 165-10-3-4(f). It may be advisable to take a copy of this form to location when cementing work is performed.

TYPE OR USE BLACK INK ONLY

*Operator Cimarex		OOOOTC 21194	
*Well Name/No Hines Federal 1H-0235X		County Grady	
*Location	SW 1/4 SW 1/4 SE 1/4	Sec 02	Twp 10N Rge 08W

Cement Casing Data	Conductor Casing	Surface Casing	Alternative Casing	Intermediate Casing	Production String	Liner
Cementing Date				05/10/17		
*Size of Drill Bit (inches)				12 1/4		
*Estimated % wash or hole enlargement used in calculations				30%		
*Size of Casing (inches O.D.)				9 5/8		
*Top of Liner (if liner used) (ft.)						
*Setting Depth of Casing (ft) from ground level				10720		
Type of Cement (API Class)				35.65 Poz. H		
In first (lead) or only slurry				H		
In second slurry						
In third slurry						
Sacks of Cement Used				703		
In first (lead) or only slurry				463		
In second slurry						
In third slurry						
Vol of slurry pumped (Cu ft)(14.7X15)				1,597		
In first (lead) or only slurry				495		
In second slurry						
In third slurry						
Calculated Annular Height of Cement behind pipe (ft)				3,638		
Cement left in pipe (ft)				129		

*Amount of Surface Casing Required (from Form 1000) _____ ft.

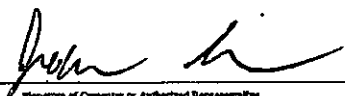
*Was cement circulated to Ground Surface? _____ Yes _____ No	*Was Cement Staging Tool (DV Tool) used? _____ Yes _____ No
*Was Cement Bond Log run? _____ Yes _____ No (If so, Attach Copy)	*If Yes, at what depth? _____ ft


CEMENTING COMPANY AND OPERATOR MUST COMPLY WITH THE INSTRUCTIONS ON REVERSE SIDE OF FORM

* Denotes items to be completed by Operator
Items not so designated shall be completed by the Cementing Company

Remarks

Remarks

CEMENTING COMPANY
I declare under applicable Corporation Commission rule, that I am authorized to make certification, that the cementing of casing in this well as shown in the report facts presented on both sides on both sides of this form are true, correct and complete to the best of my knowledge. This certification covers cementing data only.

Signature of Cementer or Authorized Representative

OPERATOR
I declare under applicable Corporation Commission rule, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct and complete to the best of my knowledge. This certification covers all well data and information presented herein.

Signature of Operator or Authorized Representative

Name & Title (Printed or Typed)	Juan Sapp	
Cementing Company	Schlumberger	
Address	560 W Jensen Rd	
City	El Reno	
State	Oklahoma	Zip 73036
Telephone (A/C) Number	405-422-8700	
Date	05/10/17	

Name & Title (Printed or Typed)	James Broach	
Operator	Cimarex	
Address	202 S Cheyenne, Suite 1000	
City	Tulsa	
State	OK	Zip 74103
Telephone (A/C) Number	918-585-1100	
Date	05/10/17	

INSTRUCTIONS

1. A) This form shall be filed by the operator, at the O.C.C. office in Oklahoma City, with the Completion Report (Form 1002A) for a producing well or a dry hole.
 B) An original of this form shall be filed with the Completion Report, (Form 1002A), for each cementing company used on a well.
 C) The cementing of different casing strings on a well by one cementing company may be consolidated on one form.
2. Cementing Company and Operator shall comply with the applicable portions of OAC 165 10-3-4
3. Set surface casing 50 feet below depth of treatable water to be protected and cement from casing shoe to ground surface or as allowed by OAC 165 10-3-4

CEMENTING REPORT

Form 1002C
Rev. 2012

OKLAHOMA CORPORATION COMMISSION
Oil & Gas Conservation Division
Post Office Box 52000
Oklahoma City, Oklahoma 73152-2000
OAC 165.10-3-4(i)

API No.
35051241170000

This form shall be filed with the Completion Report, (Form 1002A). The signature on this statement must be that of qualified employees of the cementing company and operator to demonstrate compliance with OAC 165.10-3-4(i). It may be advisable to take a copy of this form to location when cementing work is performed.

TYPE OR USE BLACK INK ONLY

*Operator CIMAREX ENERGY	OCCOTC 21194
*Well Name/No. HINES FEDERAL 1H-0235X	County GRADY
*Location SW 1/4 SW 1/4 SW 1/4 SE 1/4	Sec 02
Twp 10N	Rge 08W

Cement Casing Data	Conductor Casing	Surface Casing	Alternative Casing	Intermediate Casing	Production String	Liner
Cementing Date					06/05/17	
*Size of Drill Bit (Inches)					9"	
*Estimated % wash or hole enlargement used in calculations					20%	
*Size of Casing (inches O D)					5.5"	
*Top of Liner (if liner used) (ft.)					N/A	
*Setting Depth of Casing (ft.) from ground level					21634'	
Type of Cement (API Class)					Poz-H	
In first (lead) or only slurry					N/A	
In second slurry					N/A	
In third slurry					N/A	
Sacks of Cement Used					3460	
In first (lead) or only slurry					N/A	
In second slurry					N/A	
In third slurry					N/A	
Vol of slurry pumped (Cu ft)(14.X15)					4616.88	
In first (lead) or only slurry					N/A	
In second slurry					N/A	
In third slurry					N/A	
Calculated Annular Height of Cement behind pipe (ft)					14534'	
Cement left in pipe (ft)					0	

*Amount of Surface Casing Required (from Form 1000) _____ ft.

*Was cement circulated to Ground Surface? Yes <input checked="" type="checkbox"/> No	*Was Cement Staging Tool (DV Tool) used? Yes <input checked="" type="checkbox"/> No
*Was Cement Bond Log run? Yes No (If no, Attach Copy)	*If Yes, at what depth? _____ ft

CEMENTING COMPANY AND OPERATOR MUST COMPLY WITH THE INSTRUCTIONS ON REVERSE SIDE OF FORM

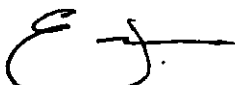
* Designates items to be completed by Operator.
Items not so designated shall be completed by the Cementing Company.

Remarks

*Remarks

CEMENTING COMPANY

I declare under applicable Corporation Commission rule, that I am authorized to make certification, that the cementing of casing in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct and complete to the best of my knowledge. This certification covers cementing data only



Signature of Cementor or Authorized Representative

OPERATOR

I declare under applicable Corporation Commission rule, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct and complete to the best of my knowledge. This certification covers all well data and information presented herein.



Signature of Operator or Authorized Representative

Name & Title (Printed or Typed)		Ernesto Monterroza	
Cementing Company		Schlumberger	
Address		560 W. Jensen Rd.	
City		El Reno	
State	Oklahoma	Zip	73036
Telephone (AC) Number		405-422-8700	
Date		06/06/17	

Name & Title (Printed or Typed)		Matt Hoffman	
*Operator		CIMAREX ENERGY	
*Address		202 S Cheyenne, Suite 1000	
*City		Tulsa	
*State	OK	*Zip	74103
Telephone (AC) Number		918-585-1100	
*Date		06/06/17	

INSTRUCTIONS

- This form shall be filed by the operator, at the O.C.C. office in Oklahoma City, with the Completion Report (Form 1002A) for a producing well or a dry hole
 - An original of this form shall be filed with the Completion Report, (Form 1002A), for each cementing company used on a well
 - The cementing of different casing strings on a well by one cementing company may be consolidated on one form.
- Cementing Company and Operator shall comply with the applicable portions of OAC 165.10-3-4
- Set surface casing 50 feet below depth of treatable water to be protected and cement from casing shoe to ground surface or as allowed by OAC 165.10-3-4.



Actual Wellpath Report

AWP
Page 1 of 8



REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Company	Slot	Hines Federal 1H 0235X
Area	Oklahoma	Well	Subject
Field	Grady County, OK (Cimarex Energy Company) NAD27 / Grid	Wellbore	Hines Federal 1H 0235X Actual
Facility	Hines Federal 1H 0235X Section 2 10N 8W		

REPORT SETUP INFORMATION

Projection System	NAD27 / Lambert Oklahoma SP, Southern Zone (3502), US feet	Software System	WellArchitect® 5.0
North Reference	Grid	User	Ferrmikj
Scale	1.000028	Report Generated	26/Jun/2017 at 8:55:51 AM
Convergence at slot	0.01" West	Database/Source file	OKC/C:\Users\Ferrmikj\AppData\Roaming\Well Explorer\temp\Cimarex Hines Federal 1H 0235X_Svy (06-26-17).xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	0.00	0.00	1995317.00	738996.00	35°21'50.213"N	98°00'56.538"W
Facility Reference Pt			1995317.00	738996.00	35°21'50.213"N	98°00'56.538"W
Field Reference Pt			609601.22	0.00	33°14'50.100"N	102°32'53.015"W

WELLPATH DATUM

Calculation method	Minimum curvature	Rig on Hines Federal 1H 0235X (RKB) to Facility Vertical Datum	25.00ft
Horizontal Reference Pt	Slot	Rig on Hines Federal 1H 0235X (RKB) to Mean Sea Level	1302.00ft
Vertical Reference Pt	Rig on Hines Federal 1H 0235X (RKB)	Rig on Hines Federal 1H 0235X (RKB) to Mud Line at Slot (Hines Federal 1H 0235X)	25.00ft
MD Reference Pt	Rig on Hines Federal 1H 0235X (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	4.15°



Actual Wellpath Report

AWP
Page 2 of 8



REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Company	Slot	Hines Federal 1H 0235X
Area	Oklahoma	Well	Subject
Field	Grady County, OK (Cimarex Energy Company) NAD27 / Grid	Wellbore	Hines Federal 1H 0235X Actual
Facility	Hines Federal 1H 0235X Section 2 10N 8W		

WELLPATH DATA (256 stations) † = interpolated/extrapolated station										
MD [m]	Inclination [°]	Azimuth [°]	TVD [m]	Vert Sect [m]	North [m]	East [m]	Grid East [US ft]	Grid North [US ft]	OLS [°/100m]	Comments
0.00	0.000	53.280	0.00	0.00	0.00	0.00	1995317.00	738996.00	0.00	
25.00	0.000	53.280	25.00	0.00	0.00	0.00	1995317.00	738996.00	0.00	
126.80	0.170	53.280	126.80	0.10	0.09	0.12	1995317.12	738996.09	0.17	
219.60	0.390	63.650	219.60	0.35	0.31	0.51	1995317.51	738996.31	0.24	
311.40	0.450	64.620	311.40	0.69	0.61	1.12	1995318.12	738996.61	0.07	
361.00	0.610	89.790	380.99	0.85	0.72	1.74	1995318.74	738996.72	0.40	
473.10	0.650	87.460	473.09	0.95	0.75	2.75	1995319.75	738996.75	0.05	
565.60	0.810	86.090	565.58	1.10	0.82	3.93	1995320.93	738996.82	0.17	
657.30	0.890	93.290	657.27	1.20	0.82	5.28	1995322.28	738996.82	0.15	
749.50	1.010	99.150	749.46	1.14	0.65	6.90	1995323.80	738996.65	0.17	
841.90	1.000	97.060	841.84	1.03	0.42	8.41	1995325.41	738996.42	0.04	
934.50	1.050	94.850	934.43	0.98	0.25	10.05	1995327.05	738996.25	0.07	
1026.20	1.240	93.860	1026.11	0.97	0.11	11.88	1995328.88	738996.11	0.21	
1087.20	1.210	92.650	1087.10	0.99	0.04	13.18	1995330.18	738996.04	0.06	
1116.90	1.280	93.710	1116.79	1.00	0.00	13.63	1995330.63	738996.00	0.25	
1208.70	1.300	93.910	1208.57	1.02	-0.13	15.89	1995332.89	738995.87	0.02	
1303.20	1.250	96.570	1303.04	0.98	-0.33	17.98	1995334.98	738995.67	0.08	
1397.60	1.280	96.910	1397.42	0.88	-0.57	20.05	1995337.05	738995.43	0.03	
1492.40	1.280	99.970	1492.20	0.73	-0.88	22.14	1995339.15	738995.12	0.07	
1586.80	1.260	105.810	1586.57	0.41	-1.35	24.18	1995341.18	738994.65	0.14	
1681.30	1.360	107.560	1681.05	-0.06	-1.97	26.25	1995343.25	738994.03	0.11	
1775.80	1.180	106.070	1775.52	-0.52	-2.58	28.26	1995345.26	738993.42	0.19	
1870.30	1.150	106.100	1870.01	-0.92	-3.11	30.10	1995347.10	738992.89	0.03	
1964.20	1.170	104.340	1963.89	-1.28	-3.61	31.94	1995348.94	738992.39	0.04	
2059.00	1.850	92.510	2058.86	-1.42	-3.91	34.24	1995351.24	738992.09	0.59	
2153.60	3.720	83.120	2153.15	-0.79	-3.60	38.64	1995355.65	738992.40	2.23	
2248.10	6.200	88.490	2247.29	0.30	-3.10	46.79	1995363.79	738992.90	2.67	
2342.30	7.640	91.520	2340.80	1.09	-3.13	58.14	1995375.14	738992.87	1.58	
2436.70	8.710	91.670	2434.24	1.68	-3.51	71.55	1995388.56	738992.49	1.13	
2531.20	9.350	89.040	2527.57	2.88	-3.59	86.38	1995403.38	738992.41	0.81	
2625.50	9.500	88.420	2620.59	4.14	-3.24	101.82	1995418.82	738992.76	0.19	
2719.90	8.250	87.850	2713.86	5.66	-2.78	116.38	1995433.38	738993.22	1.33	
2814.50	7.770	87.300	2807.54	7.17	-2.22	129.55	1995448.55	738993.78	0.51	
2909.20	8.910	89.210	2901.24	8.57	-1.82	143.27	1995460.28	738994.18	1.24	
3003.70	10.070	90.730	2994.44	9.69	-1.82	158.65	1995475.65	738994.18	1.26	
3098.30	10.270	91.130	3087.56	10.63	-2.09	175.55	1995492.56	738993.91	0.22	
3192.90	9.170	90.170	3180.80	11.60	-2.28	191.52	1995508.53	738993.72	1.18	
3287.50	8.210	89.960	3274.31	12.62	-2.30	205.82	1995522.82	738993.70	1.02	
3381.80	8.370	89.870	3367.62	13.62	-2.28	219.41	1995536.42	738993.72	0.17	
3476.50	6.960	89.440	3461.24	14.74	-2.19	233.68	1995550.69	738993.81	0.63	
3570.90	6.930	88.840	3554.49	16.02	-1.97	248.36	1995565.36	738994.03	0.10	
3665.10	9.420	89.160	3647.49	17.37	-1.71	263.37	1995580.38	738994.29	0.52	
3759.70	10.080	92.320	3740.72	18.31	-1.93	279.39	1995596.39	738994.07	0.90	
3854.30	10.070	93.190	3833.86	18.72	-2.73	295.92	1995612.92	738993.27	0.16	
3948.70	10.260	92.590	3926.78	19.08	-3.57	312.55	1995629.55	738992.43	0.23	



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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Company	Slot	Hines Federal 1H 0235X
Area	Oklahoma	Well	Subject
Field	Grady County, OK (Cimarex Energy Company) NAD27 / Grid	Wellbore	Hines Federal 1H 0235X Actual
Facility	Hines Federal 1H 0235X Section 2 10N 8W		

WELLPATH DATA (256 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	DLS [°/100ft]	Comments
4043.30	10.150	91.240	4019.89	19.74	-4.13	325.30	1995548.31	738991.87	0.28	
4138.00	9.350	90.740	4113.22	20.62	-4.41	345.34	1995662.35	738991.59	0.85	
4232.50	9.170	90.310	4206.49	21.58	-4.55	360.54	1995677.55	738991.45	0.20	
4327.10	8.520	89.140	4299.96	22.70	-4.48	375.09	1995692.10	738991.52	0.71	
4421.80	8.720	89.850	4393.59	23.85	-4.36	389.28	1995706.29	738991.64	0.24	
4516.50	9.340	89.450	4487.12	25.02	-4.27	404.15	1995721.16	738991.73	0.66	
4611.00	8.560	88.410	4580.46	26.35	-4.00	418.84	1995735.86	738992.00	0.84	
4705.60	8.330	87.550	4674.04	27.85	-3.51	432.73	1995749.74	738992.49	0.28	
4800.30	9.300	85.460	4767.62	29.79	-2.61	447.21	1995764.22	738993.39	1.08	
4894.90	10.030	84.390	4860.88	32.34	-1.20	463.03	1995780.04	738994.80	0.79	
4989.30	9.370	83.920	4953.93	35.10	0.42	478.85	1995795.86	738996.42	0.70	
5083.90	9.330	90.020	5047.27	37.03	1.23	494.18	1995811.19	738997.23	1.05	
5178.50	9.550	94.100	5140.59	37.59	0.67	509.67	1995826.89	738998.67	0.74	
5272.90	9.080	92.820	5233.75	37.77	-0.26	524.91	1995841.92	738999.74	0.56	
5367.30	8.710	86.530	5327.02	38.89	-0.19	539.47	1995856.48	738999.81	1.09	
5461.50	7.960	86.400	5420.22	40.71	0.65	553.10	1995870.11	738996.85	0.80	
5555.90	8.930	88.140	5513.60	42.36	1.30	566.94	1995883.96	738997.30	1.06	
5650.50	8.870	88.170	5607.06	43.89	1.77	581.57	1995898.59	738997.77	0.06	
5745.30	8.310	89.270	5700.80	45.24	2.09	595.73	1995912.74	738998.09	0.62	
5839.90	8.560	89.610	5794.37	46.36	2.22	609.60	1995926.62	738998.22	0.27	
5934.40	8.080	89.560	5887.86	47.47	2.32	623.26	1995940.29	738998.32	0.51	
6028.90	7.710	88.820	5981.48	48.59	2.50	636.25	1995953.27	738998.50	0.41	
6123.30	7.260	88.430	6075.08	49.77	2.80	648.55	1995965.56	738998.80	0.48	
6217.80	6.750	87.830	6168.87	50.98	3.17	660.07	1995977.09	738999.17	0.53	
6312.20	6.940	87.490	6262.66	52.17	3.60	670.59	1995987.61	738999.60	0.76	
6406.90	5.440	87.080	6356.91	53.30	4.05	680.05	1995997.07	739000.05	0.64	
6501.40	5.050	85.440	6451.01	54.48	4.61	688.67	1996005.69	739000.61	0.44	
6596.10	4.120	84.810	6545.41	55.67	5.25	696.21	1996013.23	739001.25	0.98	
6690.70	3.250	81.150	6639.81	56.82	5.97	702.25	1996019.26	739001.97	0.95	
6785.30	2.770	77.250	6734.25	58.09	6.88	707.12	1996024.14	739002.88	0.55	
6880.20	1.970	75.760	6829.10	59.27	7.79	710.94	1996027.96	739003.79	0.85	
6974.70	1.850	74.420	6923.54	60.30	8.60	713.99	1996031.00	739004.60	0.14	
7069.30	1.650	73.590	7018.10	61.29	9.40	716.77	1996033.79	739005.40	0.20	
7163.90	1.500	80.050	7112.66	62.08	10.00	719.31	1996036.32	739006.00	0.25	
7258.70	1.500	69.960	7207.43	62.89	10.64	721.69	1996038.71	739006.64	0.28	
7353.60	0.890	77.610	7302.31	63.61	11.22	723.58	1996040.60	739007.22	0.56	
7448.00	0.940	78.760	7396.70	64.02	11.53	725.06	1996042.07	739007.53	0.06	
7542.90	0.990	95.770	7491.59	64.21	11.60	726.63	1996043.65	739007.60	0.31	
7637.40	1.180	85.690	7586.07	64.33	11.59	728.42	1996045.44	739007.59	0.28	
7731.90	1.160	89.960	7680.55	64.54	11.66	730.34	1996047.38	739007.66	0.59	
7826.60	0.730	67.440	7775.24	64.85	11.90	731.86	1996048.68	739007.90	0.59	
7921.10	1.240	82.920	7869.72	65.35	12.25	733.43	1996050.45	739008.25	0.60	
8015.80	1.310	80.640	7964.20	65.80	12.55	735.11	1996052.53	739008.55	0.09	
8110.10	1.020	57.330	8058.68	66.56	13.18	737.28	1996054.30	739009.18	0.58	
8204.50	1.160	67.250	8153.06	67.49	14.01	738.87	1996055.89	739010.01	0.25	



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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Company	Slot	Hines Federal 1H 0235X
Area	Oklahoma	Well	Subject
Field	Grady County, OK (Cimarex Energy Company) NAD27 / Grid	Wellbore	Hines Federal 1H 0235X Actual
Facility	Hines Federal 1H 0235X Section 2 10N 8W		

WELLPATH DATA (256 stations)

MD [m]	Inclination [°]	Azimuth [°]	TVD [m]	Vert Sect [m]	North [m]	East [m]	Grid East [US ft]	Grid North [US ft]	DL6 [°/100m]	Comments
8299.10	1.150	64.640	8247.64	68.39	14.78	740.61	1996057.63	739010.78	0.06	
8393.60	1.040	70.510	8342.13	69.21	15.48	742.28	1996059.30	739011.46	0.17	
8487.90	0.920	71.180	8436.41	69.85	16.01	743.80	1996060.82	739012.01	0.13	
8582.40	0.960	65.670	8530.90	70.52	16.58	745.24	1996062.26	739012.58	0.10	
8677.10	1.080	65.310	8625.58	71.33	17.28	746.78	1996063.80	739013.28	0.13	
8772.00	1.160	64.520	8720.47	72.23	18.06	748.48	1996065.48	739014.06	0.09	
8866.30	1.210	65.350	8814.75	73.19	18.89	750.22	1996067.24	739014.89	0.06	
8960.70	1.130	77.830	8909.13	73.93	19.50	752.04	1996069.06	739015.51	0.28	
9055.30	1.200	76.070	9003.71	74.50	19.94	753.91	1996070.93	739015.94	0.08	
9149.80	1.230	69.820	9098.19	75.23	20.53	755.82	1996072.84	739016.53	0.14	
9244.20	1.170	64.050	9192.57	76.13	21.30	757.64	1996074.66	739017.30	0.14	
9338.70	1.080	62.490	9287.05	77.08	22.14	759.30	1996076.32	739018.14	0.10	
9433.20	1.210	61.150	9381.53	78.09	23.03	760.96	1996077.98	739019.03	0.14	
9527.70	1.550	67.390	9476.00	79.21	24.00	763.01	1996080.04	739020.00	0.39	
9622.30	1.480	60.960	9570.57	80.48	25.09	765.26	1996082.28	739021.09	0.19	
9716.80	1.670	45.260	9665.03	82.16	26.85	767.31	1996084.33	739022.65	0.50	
9811.30	1.620	41.640	9759.49	84.26	28.62	769.17	1996086.20	739024.62	0.12	
9905.50	1.480	43.820	9853.66	86.25	30.49	770.90	1996087.92	739026.48	0.16	
10000.10	1.320	56.960	9948.23	87.85	31.96	772.66	1996089.68	739027.96	0.38	
10094.80	1.090	49.650	10042.91	89.14	33.14	774.26	1996091.28	739029.14	0.29	
10189.40	1.140	54.380	10137.49	90.38	34.27	775.71	1996092.73	739030.27	0.11	
10283.90	1.250	67.280	10231.97	91.44	35.22	777.43	1996094.45	739031.22	0.31	
10378.60	1.410	68.910	10326.85	92.41	36.04	779.47	1996096.49	739032.04	0.17	
10473.60	1.420	67.720	10421.62	93.43	36.90	781.65	1996098.67	739032.90	0.03	
10568.10	1.210	69.570	10516.09	94.36	37.70	783.67	1996100.69	739033.70	0.23	
10662.60	0.990	58.730	10610.58	95.25	38.47	785.30	1996102.32	739034.47	0.32	
10757.10	0.910	74.010	10705.06	95.98	39.10	786.72	1996103.74	739035.10	0.28	
10851.70	1.130	73.840	10799.65	96.57	39.56	788.34	1996105.36	739035.57	0.23	
10946.30	1.340	63.520	10894.23	97.45	40.32	790.22	1996107.24	739036.32	0.32	
11041.00	1.490	64.100	10988.90	98.64	41.35	792.32	1996109.34	739037.35	0.18	
11135.60	1.770	66.050	11083.46	99.94	42.48	794.76	1996111.78	739038.48	0.30	
11230.30	1.950	68.200	11178.11	101.33	43.67	797.59	1996114.62	739039.67	0.20	
11324.80	2.190	72.810	11272.55	102.69	44.80	800.81	1996117.83	739040.80	0.31	
11419.40	2.380	79.330	11366.88	103.79	45.65	804.26	1996121.28	739041.65	0.36	
11459.00	3.420	42.790	11402.63	104.96	46.70	805.93	1996122.95	739042.70	5.05	
11487.00	5.930	24.260	11434.52	107.26	48.91	807.26	1996124.28	739044.91	9.06	
11519.00	9.370	12.130	11466.23	111.39	52.97	808.48	1996125.50	739048.97	11.82	
11550.00	13.180	6.980	11496.63	117.43	58.94	809.44	1996126.46	739054.95	12.70	
11582.00	16.480	6.300	11527.56	125.61	67.08	810.38	1996127.41	739063.08	10.33	
11613.00	20.210	4.890	11556.98	135.36	76.79	811.32	1996128.35	739072.79	12.12	
11644.00	23.260	3.190	11585.77	146.84	88.24	812.12	1996129.14	739084.24	10.05	
11676.00	26.330	359.130	11614.82	160.23	101.65	812.37	1996129.39	739097.65	10.97	
11707.00	30.160	355.450	11642.12	174.78	116.29	811.64	1996128.66	739112.29	13.57	
11739.00	33.470	355.380	11669.31	191.45	133.10	810.29	1996127.31	739129.11	10.34	
11771.00	36.050	357.300	11695.60	209.52	161.31	809.13	1996126.15	739147.31	8.77	



Actual Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Company	Slot	Hines Federal 1H 0235X
Area	Oklahoma	Well	Subject
Field	Grady County, OK (Cimarex Energy Company) NAD27 / Grid	Wellbore	Hines Federal 1H 0235X Actual
Facility	Hines Federal 1H 0235X Section 2 10N 8W		

WELLPATH DATA (256 stations)

MD (m)	Inclination [°]	Azimuth [°]	TVD (m)	Vert Sect (m)	North (m)	East (m)	Grid East (US m)	Grid North (US m)	DLS (1/1000)	Comments
11802.00	39.290	0.460	11720.14	228.38	170.24	808.78	1996125.80	739166.25	12.10	
11834.00	43.430	2.760	11744.15	249.50	191.37	809.39	1996126.41	739187.37	13.78	
11865.00	47.280	3.710	11765.93	271.55	213.38	810.64	1996127.67	739209.39	12.61	
11896.00	51.520	3.060	11786.10	295.08	236.88	812.03	1996129.05	739232.88	13.77	
11928.00	54.780	2.870	11805.29	320.67	262.44	813.35	1996130.37	739258.45	10.20	
11959.00	57.830	3.060	11822.49	346.48	288.20	814.69	1996131.71	739284.21	9.85	
11991.00	60.920	2.900	11838.79	373.99	315.70	816.12	1996133.14	739311.70	9.67	
12022.00	64.070	2.860	11853.10	401.47	343.15	817.50	1996134.52	739339.16	10.16	
12054.00	67.220	2.670	11866.30	430.61	372.27	818.90	1996135.93	739368.28	9.86	
12085.00	70.060	2.140	11877.58	459.47	401.11	820.11	1996137.14	739397.12	9.30	
12117.00	73.720	1.650	11887.53	489.85	431.50	821.12	1996138.14	739427.51	11.53	
12148.00	78.230	1.000	11895.57	519.75	461.43	821.81	1996138.83	739457.44	8.35	
12180.00	78.440	0.480	11902.58	550.92	492.65	822.21	1996139.23	739488.66	7.09	
12212.00	80.880	0.260	11908.33	582.33	524.13	822.42	1996139.44	739520.14	7.65	
12243.00	83.220	359.960	11912.61	612.95	554.83	822.47	1996139.50	739550.84	7.61	
12275.00	85.320	359.300	11915.81	644.69	586.66	822.27	1996139.29	739582.68	6.88	
12306.00	86.400	359.250	11918.05	675.49	617.58	821.88	1996138.90	739613.60	3.49	
12338.00	87.080	358.660	11918.87	707.31	649.52	821.29	1996138.32	739645.54	2.81	
12369.00	88.820	359.060	11921.03	738.16	680.49	820.88	1996137.70	739676.51	5.13	
12400.00	91.260	359.700	11921.06	769.05	711.49	820.34	1996137.36	739707.51	8.76	
12432.00	93.200	0.330	11919.82	800.94	743.46	820.35	1996137.37	739739.48	6.37	
12464.00	92.740	0.610	11918.16	832.83	775.42	820.61	1996137.64	739771.44	1.68	
12556.00	92.950	2.320	11913.49	926.60	869.27	823.01	1996140.04	739865.29	1.83	
12653.00	92.800	2.540	11908.73	1021.44	964.06	827.04	1996144.06	739960.09	0.28	
12747.00	92.590	3.090	11904.31	1115.31	1057.85	831.65	1996148.57	740053.87	0.63	
12842.00	93.020	2.740	11899.66	1210.18	1152.61	836.47	1996153.50	740148.64	0.58	
12936.00	91.940	2.250	11895.59	1304.05	1246.43	840.56	1996157.58	740242.46	1.26	
13030.00	92.030	1.920	11892.33	1397.93	1340.31	843.98	1996161.00	740336.35	0.36	
13125.00	91.790	2.240	11889.17	1492.81	1435.20	847.43	1996164.45	740431.23	0.42	
13220.00	92.000	1.300	11886.03	1587.88	1530.10	850.36	1996167.38	740526.14	1.01	
13314.00	91.540	0.920	11883.12	1681.50	1624.03	852.18	1996169.20	740620.08	0.63	
13409.00	91.390	0.950	11880.69	1776.32	1718.99	853.73	1996170.75	740715.04	0.16	
13503.00	92.190	0.600	11877.76	1870.11	1812.94	855.00	1996172.02	740808.98	0.93	
13598.00	91.690	0.460	11874.54	1964.80	1907.88	855.88	1996172.90	740903.93	0.55	
13693.00	92.310	359.190	11871.23	2059.53	2002.82	855.59	1996172.81	740998.87	1.49	
13787.00	92.160	358.750	11867.56	2153.08	2096.73	853.90	1996170.52	741092.78	0.49	
13881.00	91.540	359.030	11864.53	2246.63	2190.66	852.08	1996169.10	741186.72	0.72	
13976.00	90.460	358.840	11862.67	2341.22	2285.63	850.31	1996167.34	741281.69	1.15	
14071.00	90.800	358.860	11861.82	2435.81	2380.60	848.41	1996165.43	741376.67	0.36	
14165.00	92.090	358.590	11859.45	2529.18	2474.49	844.68	1996161.70	741470.56	2.78	
14260.00	91.510	356.260	11856.47	2623.27	2569.26	838.76	1996155.78	741565.33	0.70	
14354.00	91.290	357.440	11854.17	2716.48	2663.09	833.59	1996150.61	741659.18	1.28	
14449.00	91.540	355.090	11851.83	2810.54	2757.85	827.41	1996144.43	741753.92	2.46	
14543.00	90.690	354.600	11849.83	2903.28	2851.45	818.96	1996135.98	741847.52	0.87	
14638.00	90.920	354.260	11848.33	2996.91	2945.99	809.74	1996126.76	741942.07	0.36	



Actual Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Company	Slot	Hines Federal 1H 0235X
Area	Oklahoma	Well	Subject
Field	Grady County, OK (Cimarex Energy Company) NAD27 / Grid	Wellbore	Hines Federal 1H 0235X Actual
Facility	Hines Federal 1H 0235X Section 2 10N 8W		

WELLPATH DATA (256 stations) † = interpolated/extrapolated station

MD (m)	Inclination °	Azimuth °	TVD (m)	Vert Sect (m)	North (m)	East (m)	Grid East (US ft)	Grid North (US ft)	DLS °/100ft	Comments
14732.00	90.950	354.660	1846.80	3089.55	3039.54	800.67	1996117.89	742035.82	0.43	
14827.00	90.890	354.200	1845.27	3183.17	3134.08	791.45	1996108.47	742130.16	0.49	
14922.00	91.420	355.230	1843.36	3276.87	3228.65	782.70	1996099.72	742224.74	1.22	
15016.00	91.230	358.140	1841.18	3370.04	3322.46	777.27	1996094.29	742318.55	3.10	
15111.00	90.770	359.590	1839.53	3464.61	3417.42	775.39	1996092.41	742413.51	1.80	
15205.00	90.920	359.700	1838.14	3558.31	3511.41	774.80	1996091.82	742507.50	0.20	
15300.00	90.860	358.740	1836.66	3652.95	3606.39	773.51	1996090.53	742602.48	1.01	
15394.00	91.200	358.840	1834.97	3746.52	3700.35	771.53	1996088.55	742696.45	0.38	
15489.00	91.140	359.590	1833.03	3841.15	3795.32	770.22	1996087.25	742791.42	0.79	
15583.00	91.110	359.930	1831.19	3934.85	3889.30	769.83	1996086.86	742885.41	0.36	
15678.00	90.920	0.730	1829.51	4029.63	3984.29	770.38	1996087.40	742980.39	0.87	
15772.00	90.860	0.620	1828.05	4123.44	4078.27	771.49	1996088.51	743074.38	0.13	
15867.00	90.950	1.200	1826.55	4218.28	4173.25	772.99	1996090.01	743169.36	0.62	
15961.00	90.890	1.420	1825.04	4312.15	4267.21	775.14	1996092.16	743263.32	0.24	
16056.00	91.050	1.580	1823.43	4407.03	4362.16	777.83	1996094.85	743358.28	0.24	
16151.00	92.770	0.910	1820.26	4501.85	4457.08	779.69	1996096.71	743453.20	1.94	
16245.00	92.860	0.590	1818.65	4595.51	4550.97	779.97	1996096.99	743547.09	1.58	
16340.00	93.170	0.590	1810.65	4690.04	4645.83	778.87	1996095.89	743641.95	0.38	
16434.00	93.170	0.590	1805.45	4783.55	4739.68	777.55	1996094.57	743735.80	0.10	
16522.00	93.110	0.590	1800.63	4871.10	4827.54	776.41	1996093.43	743823.86	0.25	Crossed Section 16522' MD (11800.63' TVD) 0 FSL, 1616' FEL X, 1996093.43, Y, 743823.86 Lat: 35°22'37.960"N Long: 96°00'47.172"W
16529.00	93.110	0.590	1800.25	4878.06	4834.52	776.33	1996093.36	743830.65	0.25	
16624.00	93.110	0.580	1795.09	4972.52	4929.37	774.55	1996091.57	743925.50	0.97	
16718.00	92.490	0.580	1790.50	5065.95	5023.22	771.99	1996089.01	744019.35	0.66	
16812.00	92.120	0.590	1786.72	5159.48	5117.13	770.20	1996087.22	744113.26	1.11	
16907.00	92.120	0.590	1783.21	5254.09	5212.06	769.24	1996086.26	744208.19	0.04	
17001.00	92.060	0.580	1779.78	5347.62	5305.97	767.33	1996084.35	744302.11	1.29	
17096.00	92.120	0.570	1776.31	5441.95	5400.83	763.50	1996080.52	744396.97	1.15	
17190.00	90.830	0.590	1773.89	5535.41	5494.75	760.61	1996077.63	744490.89	2.71	
17285.00	91.200	0.590	1772.21	5630.10	5589.73	760.04	1996077.06	744585.88	0.77	
17380.00	92.160	0.880	1769.42	5724.86	5684.68	760.75	1996077.77	744680.83	1.39	
17474.00	92.090	1.280	1765.94	5818.66	5778.60	762.52	1996079.54	744774.75	0.43	
17569.00	92.090	0.590	1762.47	5913.40	5873.53	763.37	1996080.39	744869.69	1.61	
17663.00	92.190	0.580	1758.96	6006.96	5967.45	761.86	1996078.88	744963.61	1.43	
17758.00	92.120	0.590	1755.39	6101.50	6062.37	760.03	1996077.05	745058.53	1.02	
17852.00	92.090	3.100	1751.94	6195.29	6156.26	762.06	1996079.08	745152.43	3.95	
17947.00	92.960	1.120	1747.75	6290.14	6251.10	765.56	1996082.58	745247.27	2.27	
18041.00	92.680	0.580	1743.13	6383.77	6344.98	765.58	1996082.60	745341.15	2.37	
18136.00	92.080	0.580	1739.17	6478.24	6439.87	763.28	1996080.30	745436.04	0.89	
18230.00	92.150	0.570	1735.70	6571.62	6533.74	759.82	1996076.84	745529.92	0.90	
18325.00	91.860	0.570	1732.36	6665.94	6628.60	755.88	1996072.90	745624.78	0.42	
18419.00	91.910	0.570	1729.25	6759.30	6722.48	752.17	1996069.19	745718.65	0.07	
18514.00	91.820	0.590	1726.16	6853.78	6817.39	749.56	1996066.58	745813.57	1.50	
18608.00	91.910	0.190	1723.10	6947.44	6911.34	749.00	1996066.02	745907.52	1.13	
18703.00	91.850	0.340	1719.98	7042.17	7006.28	749.44	1996066.46	746002.47	0.17	
18797.00	91.910	1.910	1716.90	7135.94	7100.23	750.54	1996067.56	746096.41	0.72	



Actual Wellpath Report

AWP
Page 7 of 8



REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Company	Slot	Hines Federal 1H 0235X
Area	Oklahoma	Well	Subject
Field	Grady County, OK (Cimarex Energy Company) NAD27 / Grid	Wellbore	Hines Federal 1H 0235X Actual
Facility	Hines Federal 1H 0235X Section 2 10N 8W		

WELLPATH DATA (256 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	DLS [ft/1000]	Comments
18892.00	91.910	1.110	11713.73	7230.75	7195.16	752.30	1996069.32	746191.35	0.11	
18896.00	91.970	0.150	11710.55	7324.52	7289.10	753.33	1996070.35	746285.29	1.02	
19081.00	91.910	359.810	11707.33	7419.21	7384.04	753.30	1996070.32	746380.24	0.36	
19175.00	91.910	1.250	11704.20	7512.97	7477.98	754.17	1996071.19	746474.18	1.53	
19270.00	91.910	1.320	11701.03	7607.80	7572.91	756.30	1996073.32	746569.11	0.07	
19364.00	92.860	358.890	11697.12	7701.47	7666.82	756.47	1996073.49	746663.02	2.77	
19459.00	91.940	357.360	11693.14	7795.86	7761.68	753.37	1996070.39	746757.88	1.88	
19553.00	91.850	357.340	11690.03	7889.15	7855.53	749.02	1996066.04	746851.73	0.10	
19648.00	91.910	359.020	11686.92	7983.58	7950.42	746.01	1996063.03	746946.63	1.77	
19742.00	91.910	0.480	11683.78	8077.24	8044.37	745.60	1996062.62	747040.58	1.55	
19837.00	91.450	0.510	11681.00	8172.01	8139.32	746.42	1996063.44	747135.54	0.49	
19931.00	90.920	0.190	11679.05	8265.78	8233.30	746.99	1996064.01	747229.52	0.66	
20026.00	90.860	359.560	11677.58	8360.51	8328.29	746.78	1996063.80	747324.51	0.67	
20120.00	91.050	359.060	11676.01	8454.16	8422.27	745.65	1996062.67	747418.49	0.57	
20215.00	90.950	359.710	11674.35	8548.51	8517.25	744.63	1996061.65	747513.47	0.69	
20309.00	91.020	358.430	11672.74	8642.43	8611.22	743.11	1996060.13	747607.45	1.36	
20404.00	91.020	357.340	11671.05	8736.84	8706.14	739.60	1996056.62	747702.37	1.15	
20498.00	91.450	358.260	11669.02	8830.24	8800.05	735.99	1996053.01	747796.28	1.08	
20593.00	91.450	358.260	11666.62	8924.71	8894.97	733.11	1996050.13	747891.21	0.00	
20687.00	91.350	358.480	11664.32	9018.20	8988.91	730.44	1996047.46	747985.14	0.26	
20781.00	91.450	359.050	11662.02	9111.76	9082.88	728.42	1996045.44	748079.10	0.63	
20876.00	91.540	359.490	11659.54	9206.38	9177.82	727.22	1996044.24	748174.06	0.46	
20971.00	91.480	359.750	11657.04	9301.05	9272.78	726.59	1996043.61	748269.03	0.28	
21065.00	91.510	0.650	11654.59	9394.80	9366.75	726.92	1996043.94	748362.99	0.96	
21160.00	91.540	1.090	11652.06	9489.61	9461.70	726.36	1996043.38	748457.95	0.46	
21254.00	91.510	0.260	11649.56	9583.40	9555.66	729.47	1996046.48	748551.91	0.88	
21349.00	91.510	0.020	11647.06	9678.13	9650.63	729.70	1996046.72	748646.88	0.25	
21443.00	91.570	359.770	11644.53	9771.84	9744.59	729.53	1996046.54	748740.85	0.27	
21538.00	91.510	0.080	11641.98	9866.55	9839.56	729.40	1996046.42	748835.82	0.33	
21604.00	91.540	359.320	11640.22	9932.32	9905.53	729.06	1996046.07	748930.80	1.15	
21634.00	91.540	359.320	11639.41	9962.21	9935.52	728.70	1996045.72	748931.78	0.00	Actual BHL 21634' MD (11639.41' TVD) 166' FNL, 1674' FEL X: 1996045.72, Y: 748931.78 Lat 35°23'28.480"N Long: 98°00'47.756"W

TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Hines Federal 1H 0235X PBHL	11431.02	9935.74	721.64	1996038.66	748932.00	35°23'28.482"N	98°00'47.841"W	point



Actual Wellpath Report

AWP
Page 8 of 8



REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Company	Slot	Hines Federal 1H 0235X
Area	Oklahoma	Well	Subject
Field	Grady County, OK (Cimarex Energy Company) NAD27 / Grid	Wellbore	Hines Federal 1H 0235X Actual
Facility	Hines Federal 1H 0235X Section 2 10N 8W		

WELLPATH COMPOSITION - Ref Wellbore: Hines Federal 1H 0235X Actual Ref Wellpath: AWP

Start MD (ft)	End MD (ft)	Positional Uncertainty Model	Log Name/Comment	Wellbore
25.00	1087.20	BHI Generic gyro - northseeking (Standard)	Gyros	Hines Federal 1H 0235X Actual
1087.20	11414.00	BHI Generic gyro - northseeking (Standard)	Gyro 5-14-2017	Hines Federal 1H 0235X Actual
11414.00	21604.00	BHI AutoTrak Curve (Standard)	BHI ATC	Hines Federal 1H 0235X Actual
21604.00	21634.00	Blind Drilling (std)	Projection to bit	Hines Federal 1H 0235X Actual

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

WELL FILE

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other		8. Well Name and No. HINES FEDERAL 1H-0235X
2. Name of Operator CIMAREX ENERGY COMPANY Contact: KIMBERLEIGH RHODES E-Mail: kirhodes@cimarex.com		9. API Well No. 35-051-24117-00-X1
3a. Address 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103-4311	3b. Phone No. (include area code) Ph: 918-560-7081	10. Field and Pool or Exploratory Area UNKNOWN
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 2 T10N R8W SWSE 235FSL 2410FEL 35.363948 N Lat, 98.015704 W Lon		11. County or Parish, State GRADY COUNTY, OK

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original A PD
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

Cimarex Energy Co. respectfully requests changes to the original drilling plan and Rig.

Approved:
Cactus 164

Proposed:
Helmerich and Payne 496

Please see the attached documents.

Adj DCR 4/24
Engr. [Signature]
Adj DCR 5/5

See ATTACHED COA

14. I hereby certify that the foregoing is true and correct. Electronic Submission #373677 verified by the BLM Well Information System For CIMAREX ENERGY COMPANY, sent to the Tulsa Committed to AFMSS for processing by DALE ROBINS on 04/24/2017 (17DCR0123SE)	
Name (Printed/Typed) KIMBERLEIGH RHODES	Title REGULATORY TECH
Signature (Electronic Submission)	Date 04/24/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By EDWARD FERNANDEZ [Signature]	Title PETROLEUM ENGINEER	Date 04/24/2017
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		
Office Tulsa		

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

Revisions to Operator-Submitted EC Data for Sundry Notice #373677

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type.	APDCH NOI	APDCH NOI
Lease	OKNM20396	OKNM20396
Agreement		
Operator	CIMAREX ENERGY CO 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103 Ph 918-585-1100	CIMAREX ENERGY COMPANY 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103-4311 Ph 918 585 1100
Admin Contact	KIMBERLEIGH RHODES REGULATORY TECH E-Mail kirhodes@cimarex.com Ph. 918-560-7081	KIMBERLEIGH RHODES REGULATORY TECH E-Mail kirhodes@cimarex.com Ph 918-560-7081
Tech Contact.	KIMBERLEIGH RHODES REGULATORY TECH E-Mail, kirhodes@cimarex.com Ph 918-560-7081	KIMBERLEIGH RHODES REGULATORY TECH E-Mail, kirhodes@cimarex.com Ph 918-560-7081
Location State County	OK GRADY	OK GRADY
Field/Pool	WOODFORD	UNKNOWN
Well/Facility	HINES FEDERAL 1H-0235X Sec 2 T10N R8W Mer IND SWSW 235FSL 2410FEL	HINES FEDERAL 1H-0235X Sec 2 T10N R8W SWSE 235FSL 2410FEL 35 363948 N Lat, 98 015704 W Lon

1. Casing Design Changes

Approved:

Name	Casing Depth From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft)TVD	Open Hole Size (inches)	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	BHP (psig)	Anticipated Mud Weight (ppg)	Collapse SF at Full Evacuation(1.125)	Collapse SF at 1/3 Evacuation(1.125)	Burst SF (1.125)	Cumulative Air Weight	Cumulative Buoyed Weight (lbs)	Buoyant Tension SF (1.8)
Surface	0	1500	1500	17 1/2	13-3/8"	54.50	J-55	ST&C	New	663	8.4	1.72		4.18	81,750	71,266	7.21

Requested Change:

Name	Casing Depth From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft)TVD	Open Hole Size (inches)	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	BHP (psig)	Anticipated Mud Weight (ppg)	Collapse SF at Full Evacuation(1.125)	Collapse SF at 1/3 Evacuation(1.125)	Burst SF (1.125)	Cumulative Air Weight	Cumulative Buoyed Weight (lbs)	Buoyant Tension SF (1.8)
Surface	0	1500	1500	17 1/2	13-3/8"	54.50	J-55	BT&C	New	663	8.4	1.72		4.18	81,750	71,266	11.97

8A. Casing Design and Casing Loading Assumptions:

Surface	Tension	A 1.8 design factor with effects of buoyancy: 8.40 ppg.
	Collapse	A 1.125 design factor with full internal evacuation and a collapse force equal to an 8.40 ppg mud gradient.
	Burst	A 1.125 design factor with a surface pressure equal to the anticipated BHP at setting depth. No backup or gas gradient assumed.

Casing Dimensions and Strengths:

										Capacity	
Size, in	Weight, #/ft	Grade	Thread	I.D., in	Drift I.D. in	Cplg O.D., in	Burst, psi	Collapse, psi	Tension, lbs	Bbls/ft	cu. ft./ft/
13 3/8	54.5	J55	BTC	12.615	12.459	14.375	2,730	1,130	853,000	0.1546	0.8680

2. BOPE Requirement below Intermediate

Approved:

10M System. Based on 13.5 ppg MW or 0.702 psi/ft at a 11,952' TVD and equivalent BHP 8390 psi. Using a reduction of pressure to surface of 0.22 psi/ft the required surface equipment must be greater than 5,760 psi.

Requested Change:

5M System.

The 13.5 ppg MW that is used in this area is needed for hole stability issues that are related more to rock matrix integrity and not to the actual pore pressure in the area. Pore pressure in the Woodford

or in the lateral target zone in the area (within the 9 section) has been estimated at a range of 0.58 – 0.63 psi/ft using the flowback method. Using the high end of that range at 0.63 psi/ft and subtracting the 0.22 psi/ft gradient reduction would require a BOPE system greater than 4900 psi. A 5M BOPE system would satisfy this requirement.

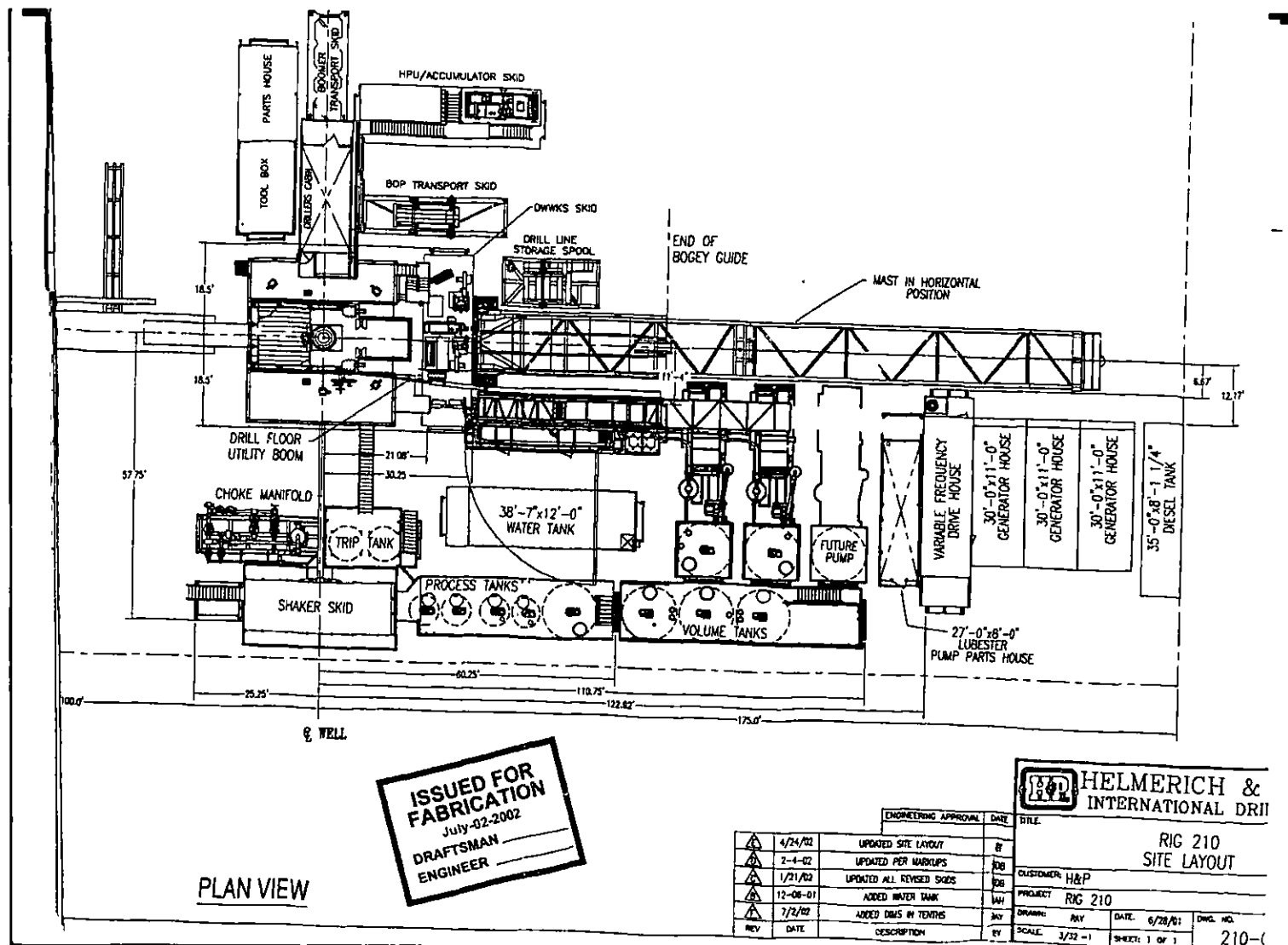
3. Rig Diagram

Approved:

Cactus 164

Requested Change:

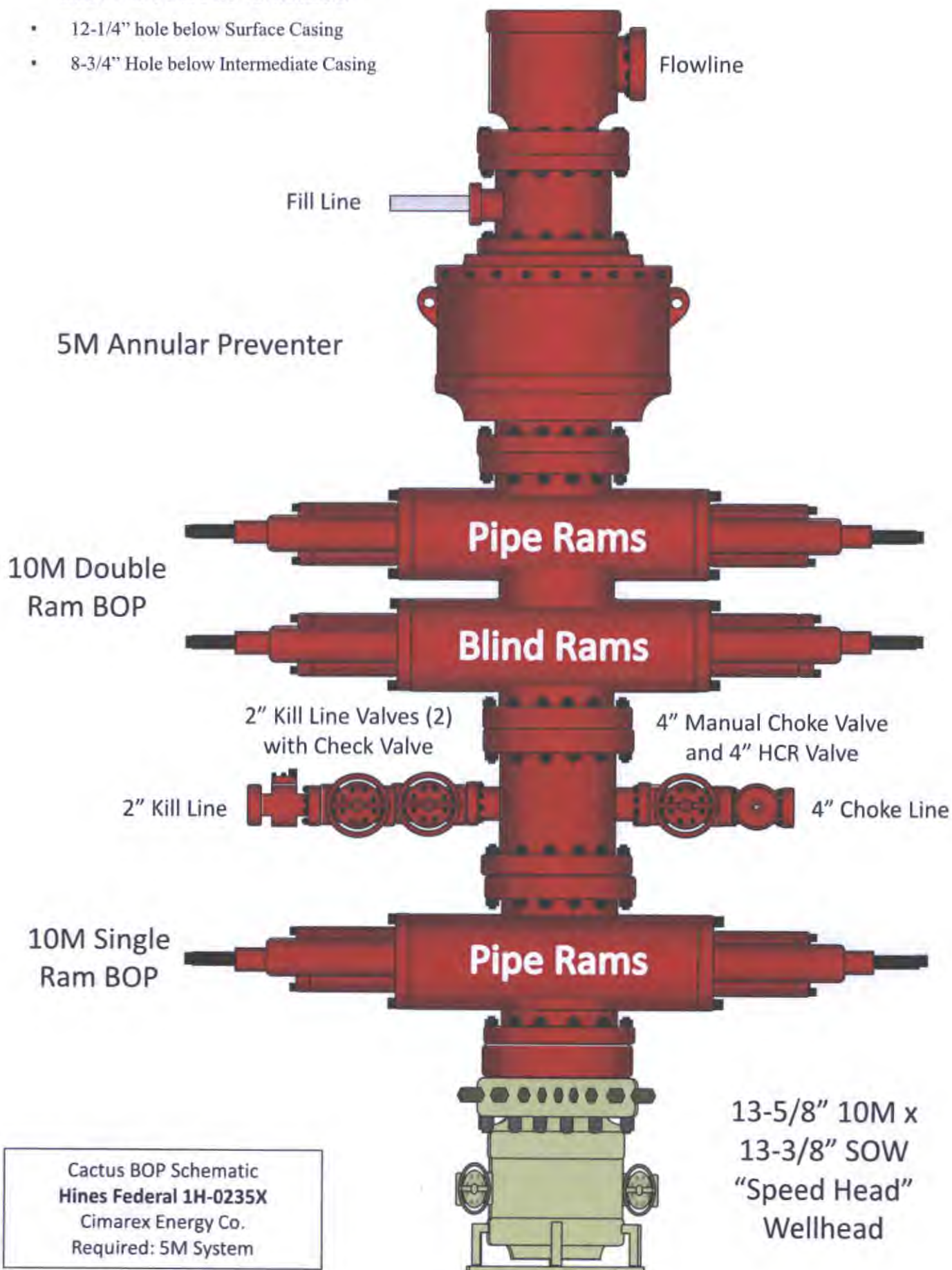
Helmerich and Payne 496 (Rig diagrams attached)



ENGINEERING APPROVAL		DATE	TITLE
4/24/02	UPDATED SITE LAYOUT	BY	RIG 210 SITE LAYOUT
2-4-02	UPDATED PER MARKUPS	JOB	CUSTOMER: H&P
1/21/02	UPDATED ALL REVERSED SKIDS	JOB	PROJECT: RIG 210
12-08-01	ADDED WATER TANK	MAN	DRAWN: RHY
7/2/02	ADDED DIMS IN TEXTS	302	DATE: 6/28/01
REV	DATE	DESCRIPTION	BY
SCALE	3/32 = 1	SHEET: 1 OF 1	210-(

Hole Sections Utilized

- 12-1/4" hole below Surface Casing
- 8-3/4" Hole below Intermediate Casing





Fernandez, Edward <efernand@blm.gov>

Hines Federal 1H-0235X - Additional Wording for Sundry Approval

1 message

Brad Cantrell <BCantrell@cimarex.com>
 To: "efernand@blm.gov" <efernand@blm.gov>
 Cc: Terri Stathem <TStathem@cimarex.com>

Mon, Apr 24, 2017 at 4 08 PM

Ed,

Please find additional justification below for the BOPE change as well as an updated schematic attached.

1. BOPE Requirement below Intermediate

Approved

10M System. Based on 13.5 ppg MW or 0.702 psi/ft at a 11,952' TVD and equivalent BHP 8390 psi. Using a reduction of pressure to surface of 0.22 psi/ft the required surface equipment must be greater than 5,760 psi.

Requested Change

5M System

The 13.5 ppg MW that is used in this area is needed for hole stability issues that are related more to rock matrix integrity and not to the actual pore pressure in the area. Pore pressure in the Woodford or in the lateral target zone in the area (within the 9 section) has been estimated at a range of 0.58 – 0.63 psi/ft using the flowback method. Using the high end of that range at 0.63 psi/ft and subtracting the 0.22 psi/ft gradient reduction would require a BOPE system greater than 4900 psi. A 5M BOPE system would satisfy this requirement.

The table below lists required MW at various points in the wellbore.

	Depth	Inclination	Required MW
Drill out of Intermediate Casing	10,674	0 deg	12.1 ppg
KOP	11,389	0 deg	12.1 ppg
Mid Curve	11,800	49.6 deg	12.5 ppg
Landing Point	12,671	90 deg	13.5 ppg
TD	22,071	90 deg	13.5 ppg

Required MW shown above that in excess of the predicted pore pressure gradient of 0.63 psi/ft (12.1 ppg equivalent) are just for hole stability due to the increased inclination. Cimarex has previously drilled a vertical pilot hole on an offset well approx. 3 mi to the northeast. The pilot was drilled through the proposed target interval into the Hunton and utilized a 10.5 ppg MW with no issues.

BRAD CANTRELL, P.E.

DRILLING & COMPLETION ENGINEER

Cimarex Energy

direct 918-560-7055

mobile 918-640-3615

bcantrell@cimarex.com

 **Hines Federal Updated BOP Diagram 24APR2017.pdf**
481K

ENGINEERING
CONDITIONS OF APPROVAL FOR THE APPLICATION FOR PERMIT TO DRILL
Sundry dated 04/24/2017

Operator: Cimarex Energy Co
Well Name: HINES FEDERAL 1H-0235X
Lease No: OKNM20396

Location:

SHL: 235' FSL & 2410' FEL, (SW¼ SE¼), Sec. 2, T. 10 N., R. 8 W., I.M., Grady County,
Oklahoma

BHL: 165' FNL & 1680' FEL, (NW¼NE¼), Sec. 35, T. 11 N., R. 8 W., I.M., Grady County,
Oklahoma

A copy of the CONDITIONS OF APPROVAL must be furnished to your field representative.

Original COA still Apply with the following changes.

II. Pressure Control

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API 53.

If the operator plans on using a multi-bowl wellhead assembly

2. Operator has proposed a **multi-bowl wellhead assembly**. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5,000 (5M) psi**.
 - a. Wellhead shall be installed by manufacturer's representatives. Submit documentation with subsequent Sundry Notice.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. **Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.**
 - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
3. **Variance approved to use flex line from BOP to choke manifold.** If you choose to use a flexible hose as opposed to a non-flexible connection between the stack and the choke manifold, the hose must be successfully tested along with the stack over each hole section at the same test pressure of the approved RAM size (RAM test pressure). Check condition of flexible line from BOP to choke manifold and replace if exterior is damaged or if line fails test. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. The

manufactures' specification and hydrostatic pressure test certification matching the hose in service information must be available on request to our inspection and enforcement personnel.

If the operator is not using a multi-bowl well head assembly, Items 4 and 5 apply

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5,000 (5M) psi**.
5. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below intermediate casing shoe shall be **5,000(5M) psi**.

5M/10M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

6. The BLM office shall be notified as stated in General Conditions of Approval above in advance for a representative to witness the BOP tests. All testing shall comply as described in Onshore Oil and Gas Order No 2 and API 53
 - a. For all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength.
 - b. The tests shall be done by an independent service company utilizing a test plug, **not a cup or J-packer**.
 - c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
 - d. The results of the test shall be reported to the appropriate BLM office.
 - e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
 - f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

V. OTHER VARIANCES TO BLM ORDERS AND REGULATIONS and COA Requirements

1. A variance approved on conditions during testing of intermediate and production casing. Section 8A of drilling program
2. Surface casing change approved as written.
3. Intermediate is to be kept liquid filled while running in hole to meet BLM minimum collapse safety factor.
4. **A 5M BOP/BOPE system is approved.** BOP/BOPE diagrams submitted with APD and on rig location shall be functionally equivalent to Onshore Order #2 and to the actual equipment on the drilling rig.

EGF 04/24/2017

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Well File

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other		5. Lease Serial No. OKNM20396
2. Name of Operator CIMAREX ENERGY COMPANY		6. If Indian, Allottee or Tribe Name
Contact: KIMBERLEIGH RHODES E-Mail: KiRhodes@cimarex.com		7. If Unit or CA/Agreement, Name and/or No.
3a. Address 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103-4311	3b. Phone No. (include area code) Ph: 918-560-7081	8. Well Name and No. HINES FEDERAL 1H-0235X
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 2 T10N R8W SWSE 235FSL 2410FEL 35.363948 N Lat, 98.015704 W Lon		9. API Well No. 35-051-24117-00-X1
		10. Field and Pool or Exploratory Area UNKNOWN
		11. County or Parish, State GRADY COUNTY, OK

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

Cimarex Energy Co. respectfully requests a variance to the conditions of approval to run logs on the Hines Federal 1H-0235X.
Attached please find an area map exhibiting adequate log coverage.

Adj DCR 4/21

14. I hereby certify that the foregoing is true and correct.	
Electronic Submission #373187 verified by the BLM Well Information System For CIMAREX ENERGY COMPANY, sent to the Tulsa Committed to AFMSS for processing by EDWARD FERNANDEZ on 04/20/2017 (17EGF0013SE)	
Name (Printed/Typed) KIMBERLEIGH RHODES	Title REGULATORY TECH
Signature (Electronic Submission)	Date 04/18/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By EDWARD FERNANDEZ <i>[Signature]</i>	Title PETROLEUM ENGINEER	Date 04/20/2017
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		
Office Tulsa		

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

Revisions to Operator-Submitted EC Data for Sundry Notice #373187

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type.	OTHER NOI	OTHER NOI
Lease	OKNM20396	OKNM20396
Agreement		
Operator	CIMAREX ENERGY 202 S CHEYENNE AVE 1000 TULSA, OK 74103 Ph 918-585-1100	CIMAREX ENERGY COMPANY 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103-4311 Ph 918.585 1100
Admin Contact	KIMBERLEIGH RHODES REGULATORY TECHNICIAN E-Mail KiRhodes@cimarex.com Ph 918-560-7081	KIMBERLEIGH RHODES REGULATORY TECH E-Mail. KiRhodes@cimarex.com Ph 918-560-7081
Tech Contact	KIMBERLEIGH RHODES REGULATORY TECHNICIAN E-Mail KiRhodes@cimarex.com Ph. 918-560-7081	KIMBERLEIGH RHODES REGULATORY TECH E-Mail KiRhodes@cimarex.com Ph 918-560-7081
Location State County	OK GRADY	OK GRADY
Field/Pool	WOODFORD	UNKNOWN
Well/Facility	HINES FEDERAL 1H-0235X Sec 2 T10N R8W SWSW 235FSL 2410FEL	HINES FEDERAL 1H-0235X Sec 2 T10N R8W SWSE 235FSL 2410FEL 35 363948 N Lat, 98 015704 W Lon

1 ANDERSON 1-36					7 KOERNER TRUST 1-12H				
35017210140000					35051235510000				
Density	7697	12126			Gamma Ray	11053	11962		
Gamma Ray	7697	12126			8 KUYKENDALL /A/ 1				
Porosity	7697	12126			35017221870000				
Resistivity	1391	12121			Density	9089	12936		
SP	1391	12121			Gamma Ray	9090	12935		
					Porosity	9089	12936		
					Resistivity	1042	12938		
					SP	1042	12934		
2 BOLLINGER 1-27HL					9 MCCOMAS /A/ 1				
35017244190000					35051208520000				
Density	1480	10318			Density	9195	12787		
Gamma Ray	1480	11343			Gamma Ray	9195	12765		
Porosity	1480	10318			Porosity	9195	12787		
Resistivity	1480	10394			Resistivity	1032	12786		
SP	1480	10396			SP	1032	12786		
3 FITZGERALD 1-11					10 MORRISON 36-1				
35051207070000					35017227390000				
Density	5982	12785			Density	6688	11716		
Gamma Ray	5982	12809			Gamma Ray	1156	11712		
Porosity	5984	12785			Porosity	6688	11716		
Resistivity	1999	12810			Resistivity	1209	11718		
SP	1999	12810			SP	1209	11718		
4 GARY 1H-3601X					11 STRAKA 1-1				
35017248120000					35017219220000				
Gamma Ray	10387	11500			Density	6496	12940		
Resistivity					Gamma Ray	1440	12923		
SP					Porosity	6488	12925		
					Resistivity	1466	12940		
					SP	1466	12940		
5 GREER 1-3H					12 STRAKA 1H-36X				
35051235480000					35017246960000				
Gamma Ray	10647	11746			Gamma Ray	10300	18944		
					Resistivity				
					SP				
6 KOERNER 1-12					13 VICKERY 1-11H				
35051231620000					35051236750000				
Density	6473	10598			Gamma Ray	11600	16950		
Gamma Ray	737	10616							
Porosity	6473	10598							
Resistivity	788	10598							
SP	782	10610							

Hines Federal 1H-0235X MD Top of WDFD



XEC Hines Federal 1H-0235X

WDFD Structure

February 2, 2017

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

WELL FILE

FORM APPROVED
OMB NO 1004-0137
Expires January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.***SUBMIT IN TRIPLICATE - Other instructions on page 2**

1 Type of Well <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other		5 Lease Serial No OKNM20396
2 Name of Operator CIMAREX ENERGY COMPANY		6 If Indian, Allottee or Tribe Name
Contact TERRI STATHEM E-Mail tstatthem@cimarex.com		7 If Unit or CA/Agreement, Name and/or No
3a Address 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103-4311	3b Phone No (include area code) Ph 432-620-1936	8 Well Name and No HINES FEDERAL 1H-0235X
4 Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec. 2 T10N R8W SWSE 235FSL 2410FEL 35.363948 N Lat, 98.015704 W Lon		9 API Well No 35-051-24117
		10 Field and Pool or Exploratory Area UNKNOWN
		11 County or Parish, State GRADY COUNTY, OK

12 CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input checked="" type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13 Describe Proposed or Completed Operation. Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

Cimarex Energy Co. respectfully requests approval to construct the drilling location pad prior to APD approval.

Please see attached drilling location pad diagram for your review and approval.

Adj. DCR 4/14

14 I hereby certify that the foregoing is true and correct. Electronic Submission #371963 verified by the BLM Well Information System For CIMAREX ENERGY COMPANY, sent to the Tulsa Committed to AFMSS for processing by DALE ROBINS on 04/14/2017 (17DCR0109SE)	
Name (Printed/Typed) TERRI STATHEM	Title MANAGER REGULATORY COMPLIANCE
Signature (Electronic Submission)	Date 04/03/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By <u>See attached</u>	Title	Date
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		Office

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

Revisions to Operator-Submitted EC Data for Sundry Notice #371963

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type	NEWCON NOI	NEWCON NOI
Lease	OKNM28183	OKNM20396
Agreement		
Operator	CIMAREX ENERGY COMPANY 202 S CHEYENNE AVE, STE 1000 TULSA, OK 74103-3001 Ph 432-620-1936	CIMAREX ENERGY COMPANY 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103-4311 Ph 918 585 1100
Admin Contact	TERRI STATHEM MANAGER REGULATORY COMPLIANCE E-Mail tstathem@cimarex.com Ph 432-620-1936	TERRI STATHEM MANAGER REGULATORY COMPLIANCE E-Mail tstathem@cimarex.com Ph 432-620-1936
Tech Contact	TERRI STATHEM MANAGER REGULATORY COMPLIANCE E-Mail tstathem@cimarex.com Ph 432-620-1936	TERRI STATHEM MANAGER REGULATORY COMPLIANCE E-Mail tstathem@cimarex.com Ph. 432-620-1936
Location State County	OK GRADY	OK GRADY
Field/Pool	WOODFORD	UNKNOWN
Well/Facility	HINES FEDERAL 1H-0235X Sec 2 T10N R8W Mer IND SWSW 235FSL 2410FEL	HINES FEDERAL 1H-0235X Sec 2 T10N R8W SWSE 235FSL 2410FEL 35 363948 N Lat, 98 015704 W Lon

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

WELL FILE

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*5. Lease Serial No.
~~OKNM28163~~ **OKNM20396**

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2

7. If Unit or CA/Agreement, Name and/or No.

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other

8. Well Name and No.

HINES FEDERAL 1H-0235X

2. Name of Operator

CIMAREX ENERGY COMPANY

Contact: TERRI STATHEM

E-Mail: tstatthem@cimarex.com

9. API Well No.

3a. Address

202 S. CHEYENNE AVE, STE 1000
TULSA, OK 74103-3001

3b. Phone No. (include area code)

Ph: 432-620-1936

10. Field and Pool or Exploratory Area
WOODFORD

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 2 T10N R8W Mer IND SWSW 235FSL 2410FEL

11. County or Parish, State

GRADY COUNTY, OK

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input checked="" type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

Cimarex Energy Co. respectfully requests approval to construct the drilling location pad prior to APD approval.

Please see attached drilling location pad diagram for your review and approval.

14. I hereby certify that the foregoing is true and correct.

**Electronic Submission #371963 verified by the BLM Well Information System
For CIMAREX ENERGY COMPANY, sent to the Tulsa**

Name (Printed/Typed) TERRI STATHEM

Title MANAGER REGULATORY COMPLIANCE

Signature (Electronic Submission)

Date 04/03/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By

Title

Field Manager

Date

4-4-2017

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

OKFO

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

APR 04 2017

OKLAHOMA CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION
P.O. BOX 52000
OKLAHOMA CITY, OK 73152-2000
(Rule 165:10-3-1)

API NUMBER 051 24117

Approval Date 03/28/2017
Expiration Date 09/28/2017

Horizontal Hole Oil & Gas

PERMIT TO DRILL

WELL LOCATION Sec 02 Twp 10N Rge 8W County GRADY
SPOT LOCATION SW SW SW SE FEET FROM QUARTER FROM SOUTH FROM EAST
SECTION LINES 235 2410

Lease Name HINES FEDERAL Well No 1H-0235X Well will be 235 feet from nearest unit or lease boundary
Operator Name CIMAREX ENERGY CO Telephone 9185851100 OTC/OCC Number 21194 0

CIMAREX ENERGY CO
202 S CHEYENNE AVE STE 1000
TULSA, OK 74103-3001

ROBERT & CAROLYN HINES
137 COUNTY STREET 2750
MINCO OK 73059

Formation(s) (Permit Valid for Listed Formations Only)

Name	Depth	Name	Depth
1 WOODFORD	11586	6	
2		7	
3		8	
4		9	
5		10	

Spacing Orders 661734
587488

Location Exception Orders

Increased Density Orders

Pending CD Numbers 201606214
201606213

Special Orders

Total Depth 22264 Ground Elevation 1278 Surface Casing: 1500 Depth to base of Treatable Water-Bearing FM 240

Under Federal Jurisdiction No Fresh Water Supply Well Drilled No Surface Water used to Drill No

PIT 1 INFORMATION

Approved Method for disposal of Drilling Fluids

Type of Pit System CLOSED Closed System Means Steel Pits

Type of Mud System WATER BASED

Chlondes Max 5000 Average 3000

Is depth to top of ground water greater than 10ft below base of pit? Y

Within 1 mile of municipal water well? N

Wellhead Protection Area? N

Pit is located in a Hydrologically Sensitive Area.

Category of Pit C

Liner not required for Category C

Pit Location is ALLUVIAL

Pit Location Formation ALLUVIUM

D One time land application -- (REQUIRES PERMIT) PERMIT NO 17-32208
H CLOSED SYSTEM=STEEL PITS (REQUIRED - CANADIAN RIVER)

This permit does not address the right of entry or settlement of surface damages
The duration of this permit is SIX MONTHS, except as otherwise provided by Rule 165 10-3-1
Rule 165 10-3-4 (c) (7) (e) - The Operator shall give 24 Hours notice by telephone to the appropriate District
Office of the Conservation Division as to when Surface Casing will be run.

HORIZONTAL HOLE 1

Sec 35 Twp 11N Rge 8W County CANADIAN

Spot Location of End Point. NW NE NW NE

Feet From NORTH 1/4 Section Line 165

Feet From EAST 1/4 Section Line 1680

Depth of Deviation 11431

Radius of Turn 760

Direction 2

Total Length 9639

Measured Total Depth 22264

True Vertical Depth 11952

End Point Location from Lease,
Unit, or Property Line 165

Notes

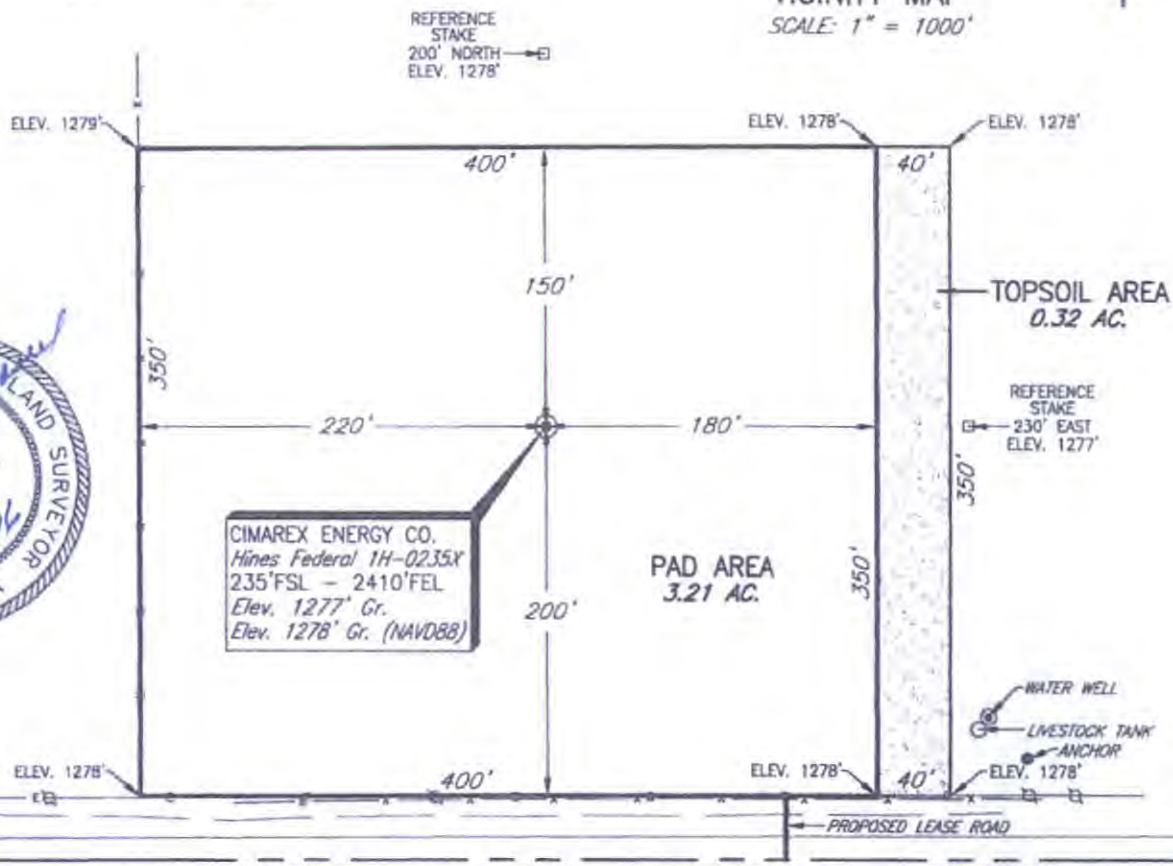
Category	Description
DEEP SURFACE CASING	3/23/2017 - G71 - APPROVED, NOTIFY OCC FIELD INSPECTOR IMMEDIATELY OF ANY LOSS OF CIRCULATION OR FAILURE TO CIRCULATE CEMENT TO SURFACE ON ANY CONDUCTOR OR SURFACE CASING
HYDRAULIC FRACTURING	3/23/2017 - G71 - OCC 165 10-3-10 REQUIRES 1) THE CHEMICAL DISCLOSURE OF HYDRAULIC FRACTURING INGREDIENTS FOR ALL WELLS BE REPORTED TO FRACFOCUS USING THE FOLLOWING LINK HTTP://FRACFOCUS.ORG/ WITH NOTICE GIVEN 48 HOURS IN ADVANCE OF FRACTURING TO THE LOCAL OCC DISTRICT OFFICE, AND, 2) PRIOR TO COMMENCEMENT OF FRACTURING OPERATIONS FOR HORIZONTAL WELLS, NOTICE ALSO GIVEN FIVE BUSINESS DAYS IN ADVANCE TO OFFSET OPERATORS WITH WELLS COMPLETED IN THE SAME COMMON SOURCE OF SUPPLY WITHIN 1/2 MILE
PENDING CD - 201606213	3/27/2017 - G64 - (I O) 2-10N-8W & 35-11N-8W EST MULTIUNIT HORIZONTAL WELL X661734 WDFD 2-10N-8W X587488 WDFD 35-11N-8W XOTHER 50% 2-10N-8W 50% 35-11N-8W CIMAREX ENERGY CO REC 2-10-2017 (JOHNSON)
PENDING CD - 201606214	3/27/2017 - G64 - (I O) 2-10N-8W & 35-11N-8W X661734 WDFD 2-10N-8W X587488 WDFD 35-11N-8W XOTHER COMPL INT. (2-10N-8W) NCT 165' FSL, NCT 0' FNL, NCT 1320' FEL COMPL INT. (35-11N-8W) NCT 0' FSL, NCT 165' FNL, NCT 1320' FEL NO OP. NAMED REC 2-10-2017 (JOHNSON)
SPACING - 587488	3/27/2017 - G64 - (640)(HOR) 35-11N-8W EST WDFD POE TO BHL NCT 165' FNL & FSL, NCT 330' FEL & FWL
SPACING - 661734	3/27/2017 - G64 - (640)(HOR) 2-10N-8W EXT 643928 WDFD, OTHER EST OTHER COMPL INT. NLT 165' FNL/FSL, NLT 330' FEL/FWL (COEXIST SP. ORDER 98732/107705 CSTR, MSSLM)

This permit does not address the right of entry or settlement of surface damages
The duration of this permit is SIX MONTHS, except as otherwise provided by Rule 165 10-3-1.
Rule 165 10-3-4 (c) (7) (e) - The Operator shall give 24 Hours notice by telephone to the appropriate District
Office of the Conservation Division as to when Surface Casing will be run

051 24117 HINES FEDERAL 1H-0235X

T 10 N - R 8 W
(INDIAN MERIDIAN)

Exhibit D-2



-NOTE-

The information shown herein is for construction purposes ONLY.

PLAT SHOWING
**PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA**

BASIS OF BEARING:
GEODETTIC

BASIS OF ELEVATION:
1270' (NAVD 88)
AT THE SE CORNER OF
SECTION 2 PER OPLS
SOLUTION.

				This plat was prepared exclusively for		SCALE: 1" = 100'
				CIMAREX ENERGY CO.		DATE: 10-11-16
				and may not be relied upon by any other entity without the written consent of Topographic Land Surveyors of Oklahoma.		INVOICE NO.: 266133
NO.	REVISION	DATE	BY	SURVEYING AND MAPPING BY		FILE: L4129A1.DWG
		ES 10-10-16		TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA		DWG. NO.: 103134-L4-129-A1
DRAWN BY: RKM				6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847		SHEET 1 OF 4
APPROVED BY: TH				Certificate of Authorization No. 1293 LS		

10 N - R 8 W

(INDIAN MERIDIAN)

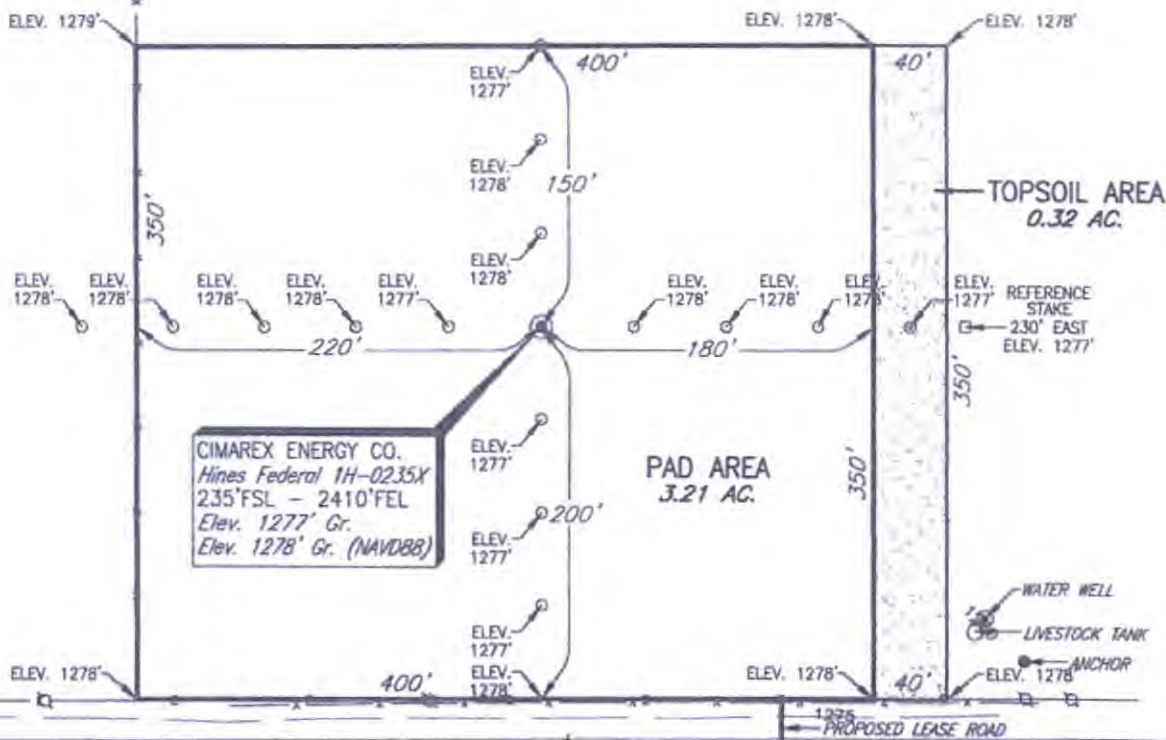
Exhibit D-2



-NOTE-
Elevations were taken at
50' intervals N., S., E.,
& W. of Location Stake.



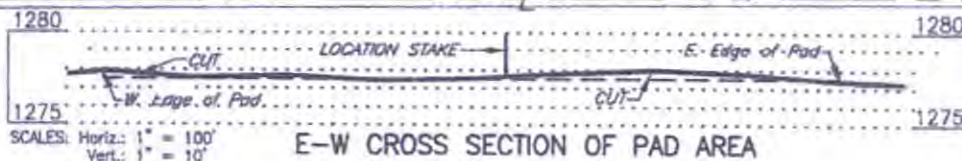
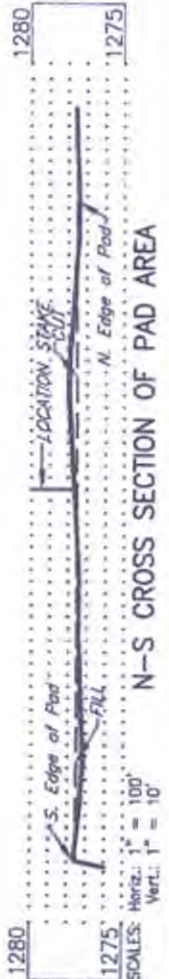
REFERENCE
STAKE
200' NORTH
ELEV. 1278'



CIMAREX ENERGY CO.
Hines Federal 1H-0235X
235'FSL - 2410'FEL
Elev. 1277' Gr.
Elev. 1278' Gr. (NAVD88)

PAD AREA
3.21 AC.

TOPSOIL AREA
0.32 AC.



E-W CROSS SECTION OF PAD AREA

PLAT SHOWING
CROSS SECTIONS OF A
PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA

-NOTE-

The information shown herein is for
construction purposes ONLY.

BASIS OF BEARING:
GEODETIC

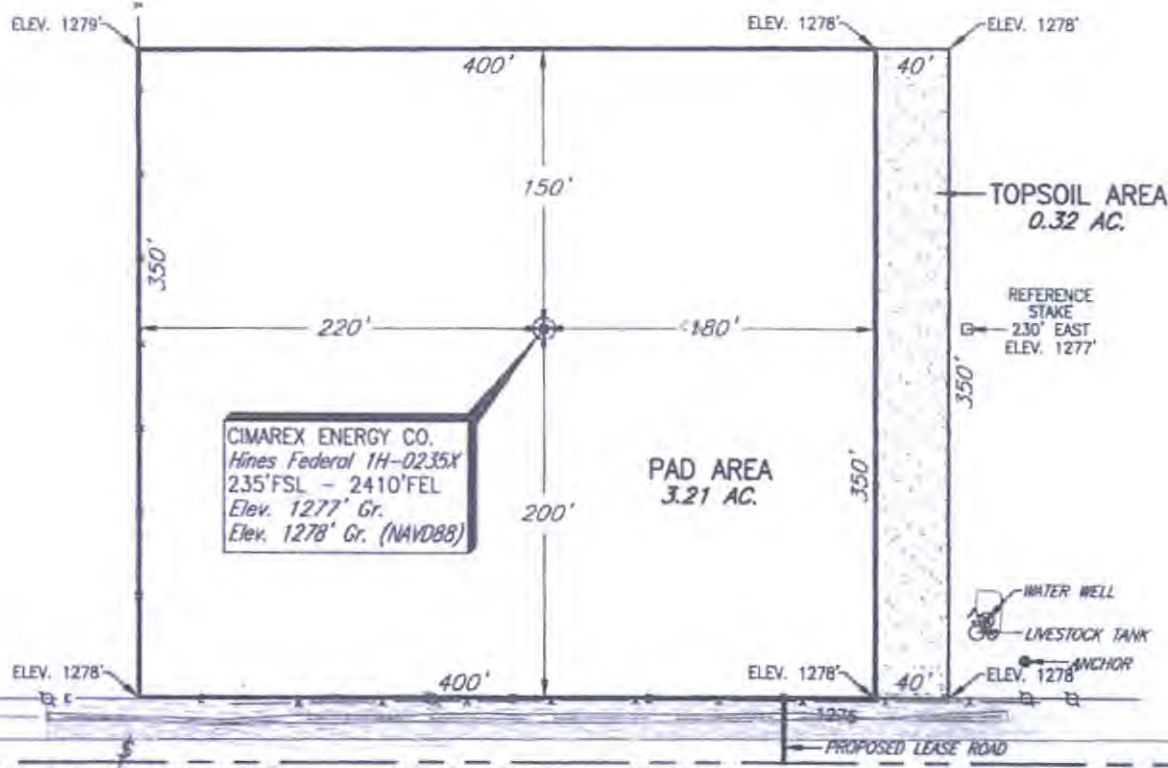
BASIS OF ELEVATION:
1270' (NAVD 88)
AT THE SE CORNER OF
SECTION 2 PER OPUS
SOLUTION.

This plat was prepared exclusively for				SCALE: 1" = 100'	
CIMAREX ENERGY CO.				DATE: 10-11-16	
and may not be relied upon by any other entity without the written consent of Topographic Land Surveyors of Oklahoma				INVOICE NO.: 266133	
NO.	REVISION	DATE	BY	FILE: L4129A1.DWG	
SURV. BY:	ES	10-10-16		DWG. NO.: 103134-L4-129-A1	
DRAWN BY:	RKM			SHEET 2 OF 4	
APPROVED BY:	TH				
SURVEYING AND MAPPING BY TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA 6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847 Certificate of Authorization No. 1293 LS					

T 10 N - R 8 W
(INDIAN MERIDIAN)
Exhibit D-2



REFERENCE
STAKE
200' NORTH
ELEV. 1278'



-NOTE-

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PLAT SHOWING
**EXISTING CONTOURS OF A
PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA**

BASIS OF BEARING:
GEODETIC

BASIS OF ELEVATION:
1270' (NAVD 88)
AT THE SE CORNER OF
SECTION 2 PER OPUS
SOLUTION.

This plot was prepared exclusively for

CIMAREX ENERGY CO.

and may not be relied upon by any other entity without the written consent of Topographic Land Surveyors of Oklahoma.

**SURVEYING AND MAPPING BY
TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA**

6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847
Certificate of Authorization No. 1293 LS

SCALE: 1" = 100'

DATE: 10-11-16

INVOICE NO.: 266133

FILE: L4129A3.DWG

DWG. NO.: 103134-L4-129-A3

SHEET 3 OF 4

NO.	REVISION	DATE	BY
		ES 10-10-16	
	DRAWN BY:	RKM	
	APPROVED BY:	TH	

T 10 N - R 8 W

(INDIAN MERIDIAN)

Exhibit D-2



PAD REPORT

Top of pad elevation: 1277.5190
 Cut Slope: 50.00% 2.00:1 26.57'
 Fill Slope: 33.33% 3.00:1 18.43'
 Balance Tolerance (C.Y.): 0.00
 Cut Swell Factor: 1.00
 Fill Shrink Factor: 1.00

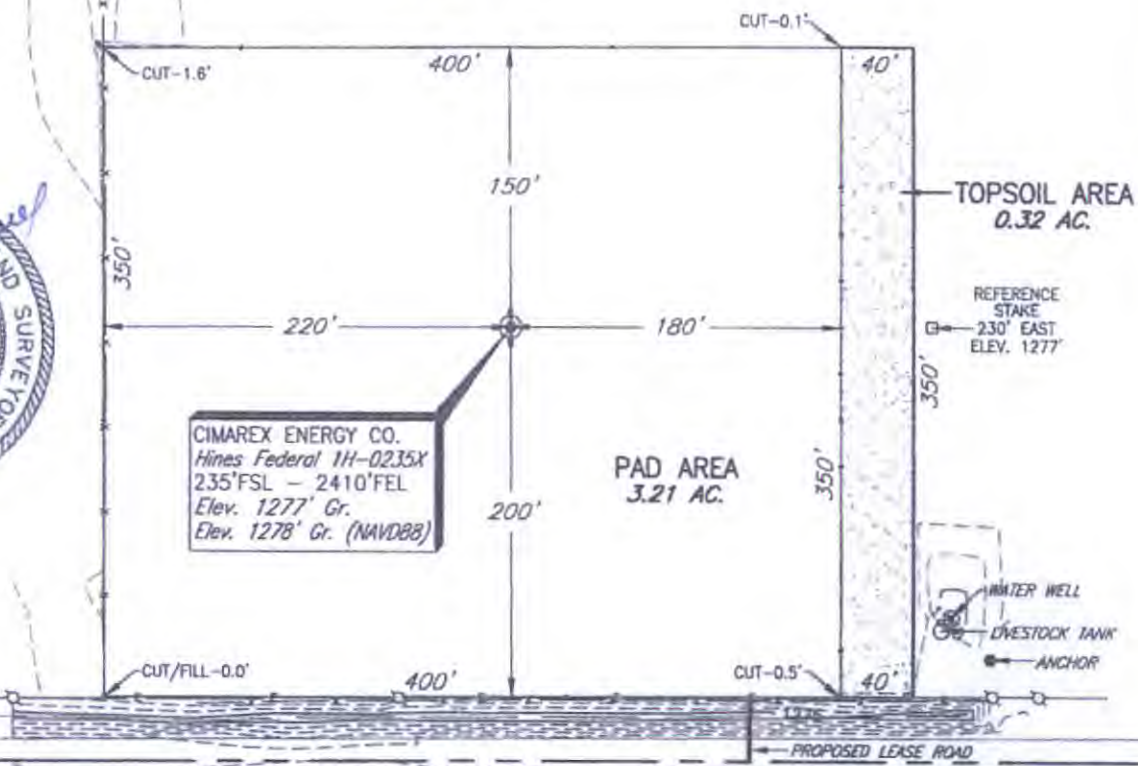
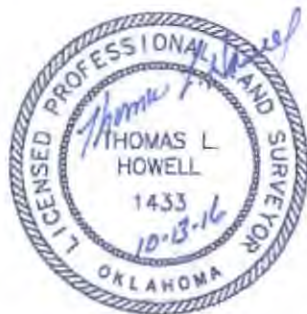
PAD EARTHWORK VOLUMES

Total cut : 16,246.1 C.F., 601.71 C.Y.
 Total fill: 16,199.6 C.F., 599.98 C.Y.
 Balance Export: 46.6 C.F., 1.73 C.Y.
 Area: 140788.9 Sq. Ft., 3.232 Acres



VICINITY MAP
 SCALE: 1" = 1000'

REFERENCE
 STAKE
 200' NORTH
 ELEV. 1278'



-NOTE-

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**PLAT SHOWING
 FINAL CONTOURS OF A
 PROPOSED PAD AREA IN THE
 SW-SE OF SECTION 2, T10N - R8W
 GRADY COUNTY, OKLAHOMA**

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 GEODEIC

BASIS OF ELEVATION:
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 AT THE SE CORNER OF
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 SOLUTION.

This plat was prepared exclusively for				SCALE: 1" = 100'			
CIMAREX ENERGY CO.				DATE: 10-12-16			
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SURVEYING AND MAPPING BY				FILE: L4129A4.DWG			
TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA				DWG. NO.: 103134-L4-129-A4			
6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847				SHEET 4 OF 4			
Certificate of Authorization No. 1293 LS							
NO.	REVISION	DATE	BY				
SURV. BY:	ES	10-10-16					
DRAWN BY:	RKM						
APPROVED BY:	TH						

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

WELL FILE

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.***SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other		5. Lease Serial No. OKNM20396
2. Name of Operator CIMAREX ENERGY COMPANY Contact: TERRI STATHEM E-Mail: tstathem@cimarex.com		6. If Indian, Allottee or Tribe Name
3a. Address 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103-4311	3b. Phone No. (include area code) Ph: 432-620-1936	7. If Unit or CA/Agreement, Name and/or No.
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 2 T10N R8W SWSE 235FSL 2410FEL 35.363948 N Lat, 98.015704 W Lon		8. Well Name and No. HINES FEDERAL 1H-0235X
		9. API Well No.
		10. Field and Pool or Exploratory Area UNKNOWN
		11. County or Parish, State GRADY COUNTY, OK

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input checked="" type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

Cimarex Energy Co. respectfully requests approval to construct the drilling location pad prior to APD approval.

Please see attached drilling location pad diagram for your review and approval.

Adj DCR 4/14

14. I hereby certify that the foregoing is true and correct. Electronic Submission #371963 verified by the BLM Well Information System For CIMAREX ENERGY COMPANY, sent to the Tulsa Committed to AFMSS for processing by DALE ROBINS on 04/14/2017 (17DCR0109SE)	
Name (Printed/Typed) TERRI STATHEM	Title MANAGER REGULATORY COMPLIANCE
Signature (Electronic Submission)	Date 04/03/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By <u>See attached</u>	Title	Date
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		Office

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

Revisions to Operator-Submitted EC Data for Sundry Notice #371963

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type	NEWCON NOI	NEWCON NOI
Lease	OKNM28183	OKNM20396
Agreement		
Operator	CIMAREX ENERGY COMPANY 202 S CHEYENNE AVE, STE 1000 TULSA, OK 74103-3001 Ph 432-620-1936	CIMAREX ENERGY COMPANY 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103-4311 Ph 918 585.1100
Admin Contact	TERRI STATHEM MANAGER REGULATORY COMPLIANCE E-Mail: tstathem@cimarex.com Ph 432-620-1936	TERRI STATHEM MANAGER REGULATORY COMPLIANCE E-Mail: tstathem@cimarex.com Ph 432-620-1936
Tech Contact	TERRI STATHEM MANAGER REGULATORY COMPLIANCE E-Mail: tstathem@cimarex.com Ph 432-620-1936	TERRI STATHEM MANAGER REGULATORY COMPLIANCE E-Mail: tstathem@cimarex.com Ph 432-620-1936
Location State County	OK GRADY	OK GRADY
Field/Pool	WOODFORD	UNKNOWN
Well/Facility	HINES FEDERAL 1H-0235X Sec 2 T10N R8W Mer IND SWSW 235FSL 2410FEL	HINES FEDERAL 1H-0235X Sec 2 T10N R8W SWSE 235FSL 2410FEL 35 363948 N Lat, 98 015704 W Lon

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

WELL FILE

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*5. Lease Serial No.
~~OKNM28183~~ **OKNM20396**

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other

8. Well Name and No.

HINES FEDERAL 1H-0235X

2. Name of Operator

CIMAREX ENERGY COMPANY

Contact: TERRI STATHEM

E-Mail: tstatthem@cimarex.com

9. API Well No.

3a. Address

202 S. CHEYENNE AVE, STE 1000
TULSA, OK 74103-3001

3b. Phone No. (include area code)

Ph: 432-620-1936

10. Field and Pool or Exploratory Area
WOODFORD

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 2 T10N R8W Mer IND SWSW 235FSL 2410FEL

11. County or Parish, State

GRADY COUNTY, OK

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input checked="" type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other
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13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

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**Electronic Submission #371963 verified by the BLM Well Information System
For CIMAREX ENERGY COMPANY, sent to the Tulsa**

Name (Printed/Typed) TERRI STATHEM

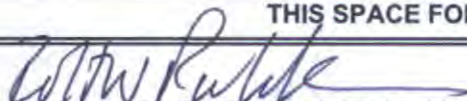
Title MANAGER REGULATORY COMPLIANCE

Signature (Electronic Submission)

Date 04/03/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By



Title

Field Manager

Date

4-4-2017

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

OKFO

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(Instructions on page 2)

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

APR 04 2017

OKLAHOMA CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION
P.O. BOX 52000
OKLAHOMA CITY, OK 73152-2000
(Rule 165:10-3-1)

API NUMBER 051 24117

Approval Date 03/28/2017
Expiration Date 09/28/2017

Horizontal Hole Oil & Gas

PERMIT TO DRILL

WELL LOCATION Sec 02 Twp 10N Rge 8W County GRADY
SPOT LOCATION SW SW SW SE FEET FROM QUARTER FROM SOUTH FROM EAST
SECTION LINES 235 2410

Lease Name HINES FEDERAL Well No 1H-0235X Well will be 235 feet from nearest unit or lease boundary
Operator Name CIMAREX ENERGY CO Telephone 9185851100 OTC/OCC Number: 21194 0

CIMAREX ENERGY CO
202 S CHEYENNE AVE STE 1000
TULSA, OK 74103-3001

ROBERT & CAROLYN HINES
137 COUNTY STREET 2750
MINCO OK 73059

Formation(s) (Permit Valid for Listed Formations Only)

	Name	Depth	Name	Depth
1	WOODFORD	11586	6	
2			7	
3			8	
4			9	
5			10	

Spacing Orders 661734
587488

Location Exception Orders

Increased Density Orders

Pending CD Numbers 201606214
201606213

Special Orders

Total Depth 22264 Ground Elevation 1278 Surface Casing. 1500 Depth to base of Treatable Water-Bearing FM 240

Under Federal Jurisdiction No Fresh Water Supply Well Drilled No Surface Water used to Drill No

PIT : INFORMATION

Approved Method for disposal of Drilling Fluids

Type of Pit System CLOSED Closed System Means Steel Pits

Type of Mud System WATER BASED

Chlorides Max 5000 Average 3000

Is depth to top of ground water greater than 10ft below base of pit? Y

Within 1 mile of municipal water well? N

Wellhead Protection Area? N

Pit is located in a Hydrologically Sensitive Area.

Category of Pit C

Liner not required for Category C

Pit Location is ALLUVIAL

Pit Location Formation ALLUVIUM

D One time land application - (REQUIRES PERMIT) PERMIT NO 17-32208
H CLOSED SYSTEM=STEEL PITS (REQUIRED - CANADIAN RIVER)

This permit does not address the right of entry or settlement of surface damages.
The duration of this permit is SIX MONTHS, except as otherwise provided by Rule 165 10-3-1
Rule 165. 10-3-4 (c) (7) (e) - The Operator shall give 24 Hours notice by telephone to the appropriate District
Office of the Conservation Division as to when Surface Casing will be run

HORIZONTAL HOLE 1

Sec 35 Twp 11N Rge 8W County CANADIAN

Spot Location of End Point NW NE NW NE

Feet From NORTH 1/4 Section Line: 165

Feet From EAST 1/4 Section Line 1680

Depth of Deviation 11431

Radius of Turn 760

Direction 2

Total Length 9639

Measured Total Depth 22264

True Vertical Depth 11952

End Point Location from Lease,
Unit, or Property Line 165

Notes

Category

Description

DEEP SURFACE CASING

3/23/2017 - G71 - APPROVED. NOTIFY OCC FIELD INSPECTOR IMMEDIATELY OF ANY LOSS OF CIRCULATION OR FAILURE TO CIRCULATE CEMENT TO SURFACE ON ANY CONDUCTOR OR SURFACE CASING

HYDRAULIC FRACTURING

3/23/2017 - G71 - OCC 165.10-3-10 REQUIRES. 1) THE CHEMICAL DISCLOSURE OF HYDRAULIC FRACTURING INGREDIENTS FOR ALL WELLS BE REPORTED TO FRACFOCUS USING THE FOLLOWING LINK [HTTP //FRACFOCUS.ORG/](http://fracfocus.org/) WITH NOTICE GIVEN 48 HOURS IN ADVANCE OF FRACTURING TO THE LOCAL OCC DISTRICT OFFICE, AND, 2) PRIOR TO COMMENCEMENT OF FRACTURING OPERATIONS FOR HORIZONTAL WELLS, NOTICE ALSO GIVEN FIVE BUSINESS DAYS IN ADVANCE TO OFFSET OPERATORS WITH WELLS COMPLETED IN THE SAME COMMON SOURCE OF SUPPLY WITHIN 1/2 MILE

PENDING CD - 201606213

3/27/2017 - G64 - (I O) 2-10N-8W & 35-11N-8W
EST MULTIUNIT HORIZONTAL WELL
X661734 WDFD 2-10N-8W
X587488 WDFD 35-11N-8W
XOTHER
50% 2-10N-8W
50% 35-11N-8W
CIMAREX ENERGY CO
REC 2-10-2017 (JOHNSON)

PENDING CD - 201606214

3/27/2017 - G64 - (I O.) 2-10N-8W & 35-11N-8W
X661734 WDFD 2-10N-8W
X587488 WDFD 35-11N-8W
XOTHER
COMPL INT (2-10N-8W) NCT 165' FSL, NCT 0' FNL, NCT 1320' FEL
COMPL INT. (35-11N-8W) NCT 0' FSL, NCT 165' FNL, NCT 1320' FEL
NO OP NAMED
REC. 2-10-2017 (JOHNSON)

SPACING - 587488

3/27/2017 - G64 - (640)(HOR) 35-11N-8W
EST WDFD
POE TO BHL NCT 165' FNL & FSL, NCT 330' FEL & FWL

SPACING - 661734

3/27/2017 - G64 - (640)(HOR) 2-10N-8W
EXT 643928 WDFD, OTHER
EST OTHER
COMPL INT NLT 165' FNL/FSL, NLT 330' FEL/FWL
(COEXIST SP ORDER 98732/107705 CSTR, MSSLM)

This permit does not address the right of entry or settlement of surface damages

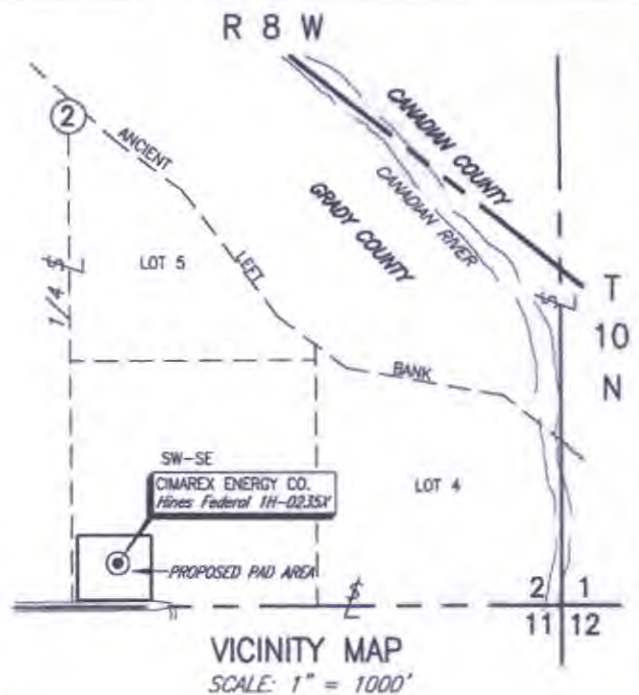
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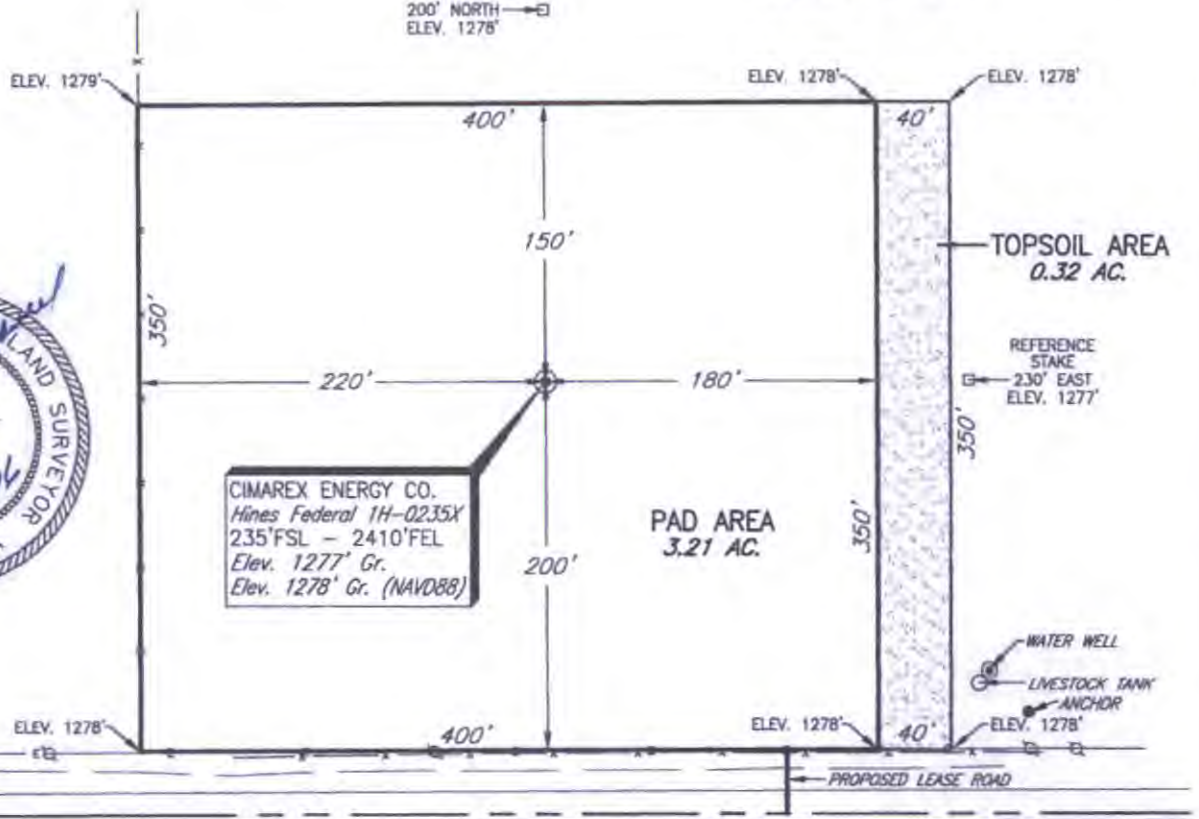
051 24117 HINES FEDERAL 1H-0235X

T 10 N - R 8 W
(INDIAN MERIDIAN)

Exhibit D-2



REFERENCE
STAKE
200' NORTH
ELEV. 1278'



PLAT SHOWING
**PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA**

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BASIS OF BEARING:
GEODETTIC

BASIS OF ELEVATION:
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DRAWN BY:	RKM			SHEET 1 OF 4	
APPROVED BY:	TH				
SURVEYING AND MAPPING BY TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA 6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847 Certificate of Authorization No. 1293 LS					

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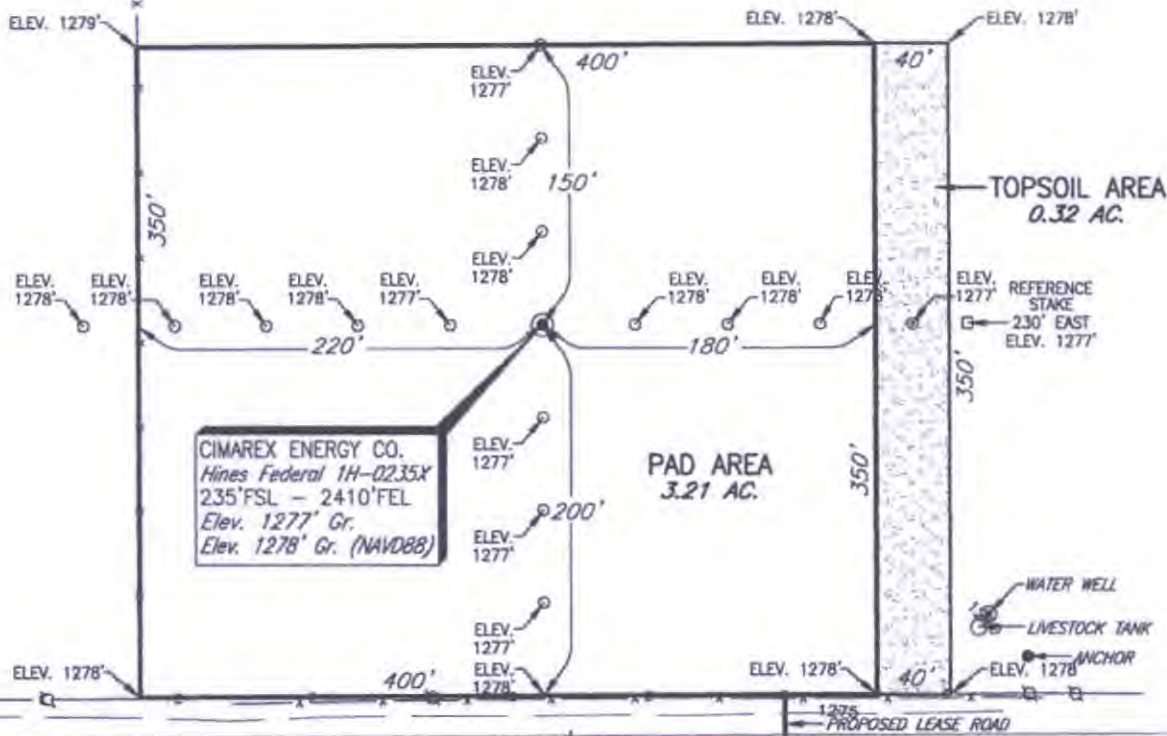
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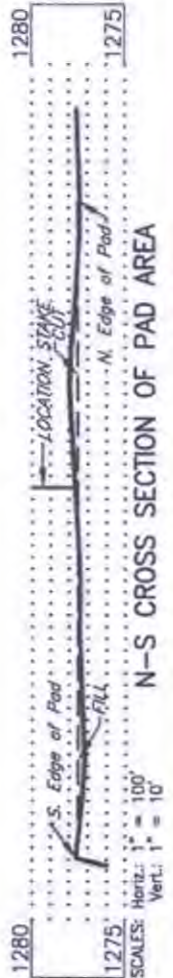
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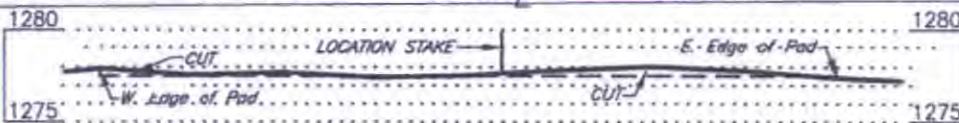
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235'FSL - 2410'FEL
Elev. 1277' Gr.
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PAD AREA
3.21 AC.

TOPSOIL AREA
0.32 AC.



N-S CROSS SECTION OF PAD AREA



E-W CROSS SECTION OF PAD AREA

PLAT SHOWING
CROSS SECTIONS OF A
PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA

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GEODETIC

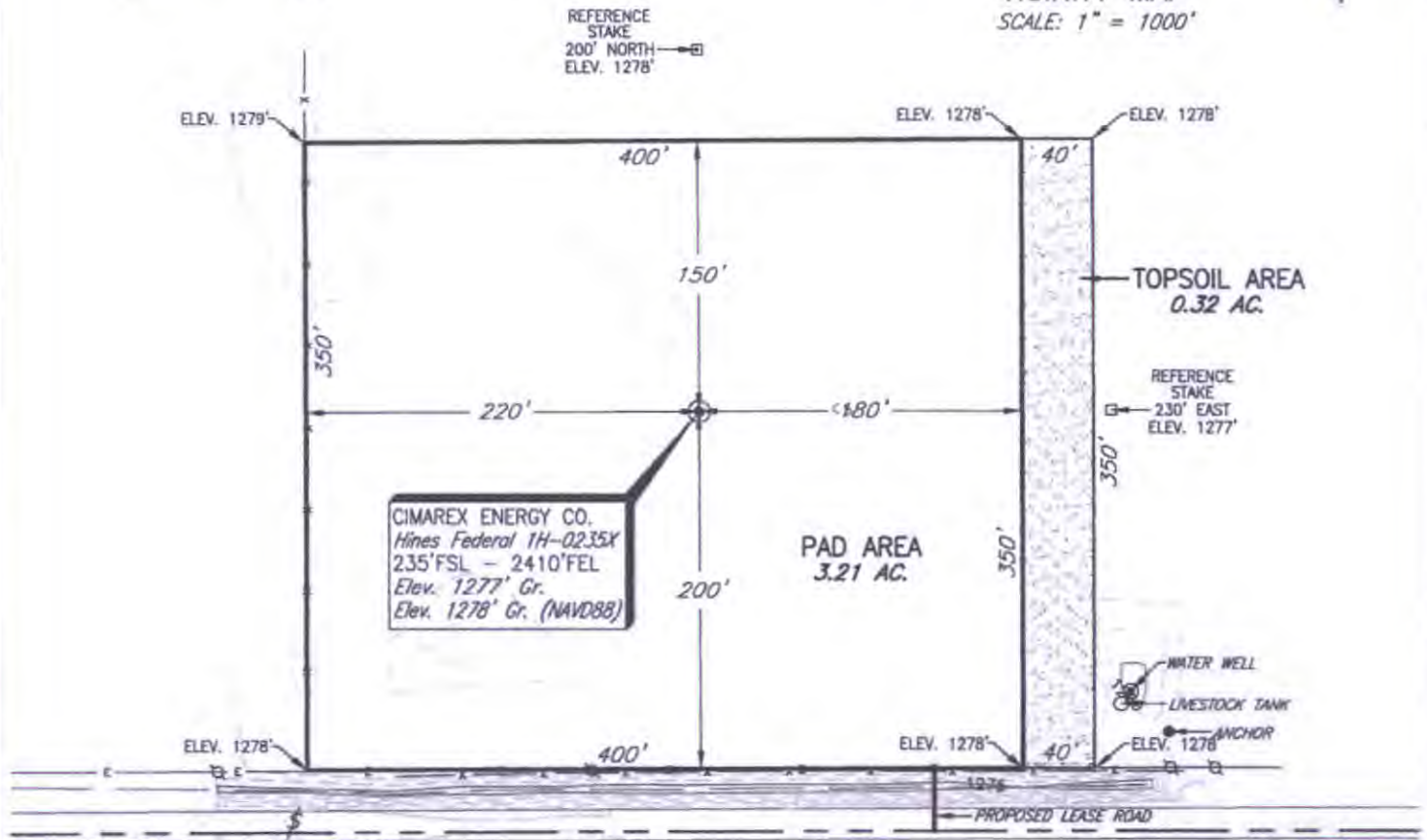
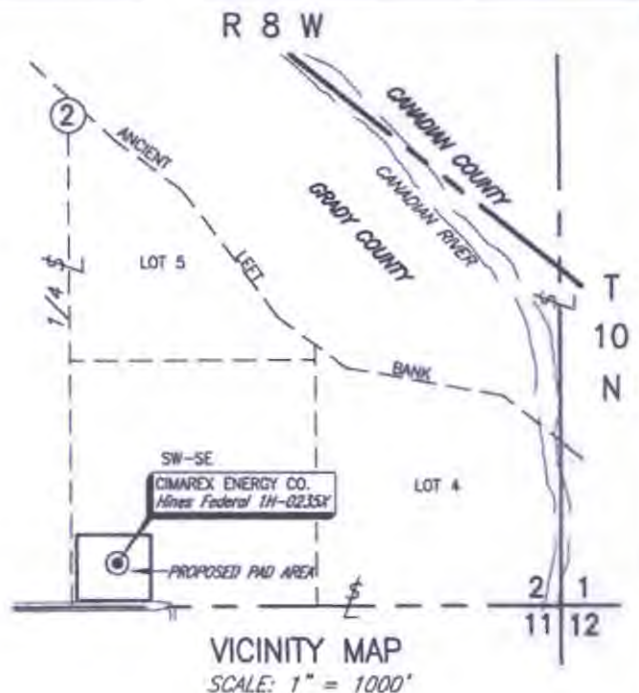
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				and may not be relied upon by any other entity without the written consent of Topographic Land Surveyors of Oklahoma.		INVOICE NO.: 266133	
NO.	REVISION	DATE	BY	SURVEYING AND MAPPING BY		FILE: L4129A1.DWG	
SURV. BY: ES 10-10-16				TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA		DWG. NO.: 103134-L4-129-A1	
DRAWN BY: RKM				6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847		SHEET 2 OF 4	
APPROVED BY: TH				Certificate of Authorization No. 1293 LS			

T 10 N - R 8 W
(INDIAN MERIDIAN)
Exhibit D-2



-NOTE-

The information shown herein is for construction purposes ONLY.

PLAT SHOWING
EXISTING CONTOURS OF A
PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA

BASIS OF BEARING:
GEODETTIC

BASIS OF ELEVATION:
1270' (NAVD 88)
AT THE SE CORNER OF
SECTION 2 PER OPUS
SOLUTION.

This plat was prepared exclusively for				CIMAREX ENERGY CO.		SCALE: 1" = 100'	
and may not be relied upon by any other entity without the written consent of Topographic Land Surveyors of Oklahoma.						DATE: 10-11-16	
NO.	REVISION	DATE	BY	SURVEYING AND MAPPING BY TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA 6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847 Certificate of Authorization No. 1293 LS		INVOICE NO.: 266133	
SURV. BY:	ES	10-10-16				FILE: L4129A3.DWG	
DRAWN BY:	RKM					DWG. NO.: 103134-L4-129-A3	
APPROVED BY:	TH					SHEET 3 OF 4	

T 10 N - R 8 W
(INDIAN MERIDIAN)
Exhibit D-2



PAD REPORT

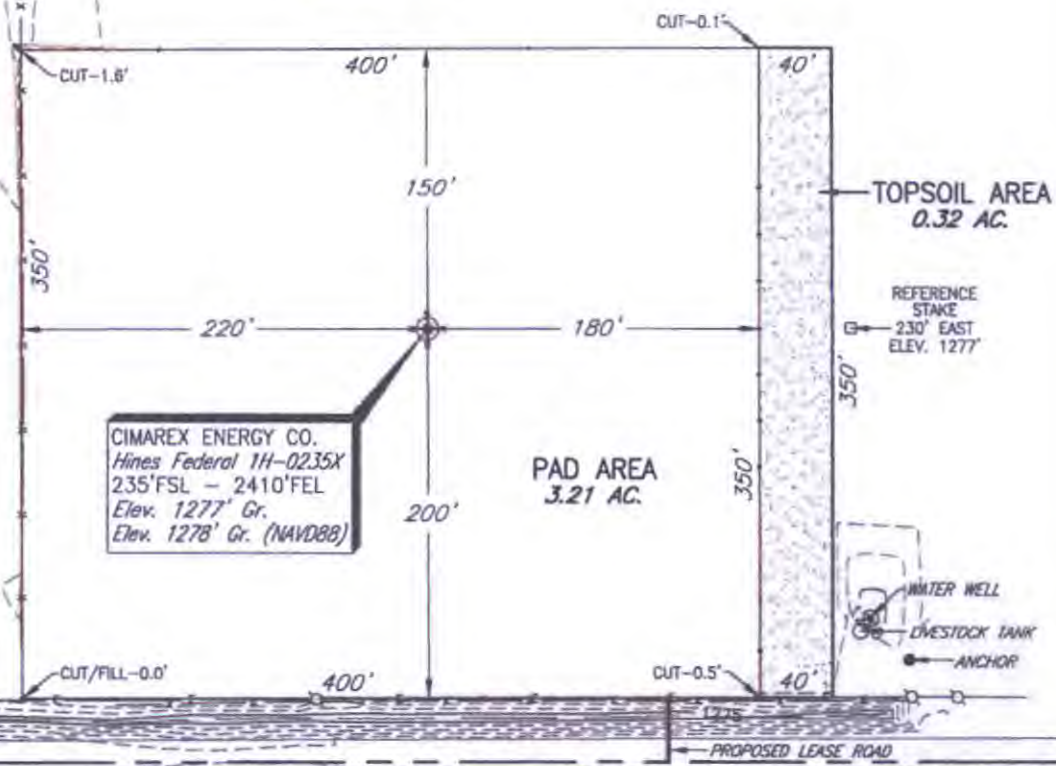
Top of pad elevation: 1277.5190
Cut Slope: 50.00% 2.00:1 26.57'
Fill Slope: 33.33% 3.00:1 18.43'
Balance Tolerance (C.Y.): 0.00
Cut Swell Factor: 1.00
Fill Shrink Factor: 1.00

PAD EARTHWORK VOLUMES

Total cut : 16,246.1 C.F., 601.71 C.Y.
Total fill: 16,199.6 C.F., 599.98 C.Y.
Balance Export: 46.6 C.F., 1.73 C.Y.
Area: 140788.9 Sq. Ft., 3.232 Acres



REFERENCE
STAKE
200' NORTH
ELEV. 1278'



PLAT SHOWING
**FINAL CONTOURS OF A
PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA**

-NOTE-

The information shown herein is for
construction purposes ONLY.

BASIS OF BEARING:
GEODEIC

BASIS OF ELEVATION:
1270' (NAVD 88)
AT THE SE CORNER OF
SECTION 2 PER OPUS
SOLUTION.

This plot was prepared exclusively for				SCALE: 1" = 100'	
CIMAREX ENERGY CO.				DATE: 10-12-16	
and may not be relied upon by any other entity without the written consent of Topographic Land Surveyors of Oklahoma				INVOICE NO.: 266133	
NO.	REVISION	DATE	BY	FILE: L4129A4.DWG	
SURV. BY:	ES	10-10-16		DWG. NO.: 103134-L4-129-A4	
DRAWN BY:	RKM			SHEET 4 OF 4	
APPROVED BY:	TH				
SURVEYING AND MAPPING BY TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA 6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847 Certificate of Authorization No. 1293 LS					

A
P
D

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

5. Lease Serial No.
OKNM20396

6. If Indian, Allottee or Tribe Name

1a. Type of work: ☒ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone

2. Name of Operator
CIMAREX ENERGY CO

8. Lease Name and Well No.
HINES FEDERAL 1H-0235X

9. API Well No.

3a. Address
202 S. Cheyenne Ave., Ste 1000 Tulsa OK 74

3b. Phone No. (include area code)
(432)620-1936

10. Field and Pool, or Exploratory
WOODFORD

4. Location of Well (Report location clearly and in accordance with any State requirements.)*

At surface SWSE / 235 FSL / 2410 FEL / LAT 35.3639478 / LONG -98.0157043

At proposed prod. zone NWNE / 165 FNL / 1680 FEL / LAT 35.3640049 / LONG -98.0160318

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 2 / T10N / R8W / IND

14. Distance in miles and direction from nearest town or post office*
0.22 miles

12. County or Parish
GRADY

13. State
OK

15. Distance from proposed*
location to nearest
property or lease line, ft.
(Also to nearest drig. unit line, if any)
235 feet

16. No. of acres in lease
398.05

17. Spacing Unit dedicated to this well
640

18. Distance from proposed location*
to nearest well, drilling, completed, 4261 feet
applied for, on this lease, ft.

19. Proposed Depth
11952 feet / 22071 feet

20. BLM/BIA Bond No. on file
FED: COB000011

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
1278 feet

22. Approximate date work will start*
02/01/2017

23. Estimated duration
30 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, must be attached to this form:

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).

4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the BLM.

25. Signature
(Electronic Submission)

Name (Printed/Typed)
Kimberleigh Rhodes / Ph: (918)560-7081

Date
11/03/2016

Title
Regulatory Technician

Approved by (Signature)
(Electronic Submission)

Name (Printed/Typed)
Robert Pawelek / Ph: (405)579-7110

Date
04/14/2017

Title
Field Manager

Office
TULSA

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)

APPROVED WITH CONDITIONS

INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM 1: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

ROUTINE USE: Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM collects this information to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications.

Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease.

The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

Additional Operator Remarks

Location of Well

- I. SHL: SWSE / 235 FSL / 2410 FEL / TWSP: 10N / RANGE: 8W / SECTION: 2 / LAT: 35.3639478 / LONG: -98.0157043 (TVD: 0 feet, MD: 0 feet)
PPP: SWNE / 2263 FNL / 1674 FEL / TWSP: 10N / RANGE: 8W / SECTION: 2 / LAT: 32.370921 / LONG: -98.013276 (TVD: 11952 feet, MD: 14700 feet)
PPP: NWNW / 958 FNL / 1671 FEL / TWSP: 10N / RANGE: 8W / SECTION: 2 / LAT: 35.3745775 / LONG: -98.0135769 (TVD: 11952 feet, MD: 14700 feet)
BHL: NWNE / 165 FNL / 1680 FEL / TWSP: 11N / RANGE: 8W / SECTION: 35 / LAT: 35.3640049 / LONG: -98.0160318 (TVD: 11952 feet, MD: 22071 feet)

BLM Point of Contact

Name: Robert Pawelek
Title: Field Manager
Phone: 4055797110
Email: rpawelek@blm.gov

Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

CONFIDENTIAL

ENGINEERING
CONDITIONS OF APPROVAL FOR THE APPLICATION FOR PERMIT TO DRILL

Operator: Cimarex Energy Co
Well Name: HINES FEDERAL 1H-0235X
Lease No: OKNM20396

Location:
SHL: 235' FSL & 2410' FEL, (SW¼ SE¼), Sec. 2, T. 10 N., R. 8 W., I.M., Grady County,
Oklahoma
BHL: 165' FNL & 1680' FEL, (NW¼ NE¼), Sec. 35, T. 11 N., R. 8 W., I.M., Grady County,
Oklahoma

A copy of the CONDITIONS OF APPROVAL must be furnished to your field representative.

1. **Verbal notification** shall be given to the assigned BLM Natural Resource Specialist at least **72 HOURS PRIOR TO PAD CONSTRUCTION.**
2. The Operator shall provide the BLM Inspection and Enforcement department a verbal notification with the following information **72 hours prior to spud.**
 - BLM lease number
 - Well Name
 - API number
 - Operator Name
 - Drilling contractor's name
 - Rig Number
 - Date and Time which the well will be spud.
3. **Verbal notification** shall be given to the BLM Inspection and Enforcement department at least **72 hours before well operations begin on the following:**
 - Well Spud (including setting conductor casing)
 - Pressure Testing BOPE, Casing, and Formation Integrity Testing
 - Setting and Cementing all Casing Strings
 - Open Hole Logging Operations
 - Drilling Over Lease Expiration for Lease Extension
4. Approval of this APD does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease that would entitle the applicant to conduct operations thereon. In addition, approval of this APD does not imply that the operator has legal access to the drilling location. When crossing private surface 43 CFR 3814 regulations must be complied with and when crossing public surface off-lease the operator must have approved rights-of-way.

5. **This APD is valid for two years from the date of approval or until the oil and gas lease expires/terminates, whichever occurs first.** If drilling of this permitted well is to result in an extension of the lease term, diligent operations (actual drilling) must be in progress before and continue through the lease expiration date and must continue diligently until well completion, advance lease rentals must have been paid, and a letter stating drilling operations were in progress must be submitted to this office no later than five days past the lease expiration date. If the APD terminates, any surface disturbance created under the application must be reclaimed according to an approved plan
- 6 All applicable local, state and/or federal laws, regulations, and/or statutes must be complied with.
- 7 A complete copy of the approved APD must be at the drill site during the construction of the roads and drill pad, the drilling of the well, and the completion of the well.

BLM Contact Information:

<i>Natural Resource Specialist (NRS)</i>	<i>Mr. Craig Willems</i>	<i>(405) 579-7177 office (405) 420-6869 cell</i>	<i>swillems@blm.gov</i>
<i>Inspection & Enforcement:</i>	<i>On Call</i>	<i>(405) 245-5048 cell</i>	
<i>Petroleum Engineer:</i>	<i>Mr. James Ashley</i>	<i>(405) 579-7132 office (918) 292-9323 cell</i>	<i>jashley@blm.gov</i>
<i>Petroleum Engineer:</i>	<i>Mr. Ed Fernandez</i>	<i>(405) 579-7134 office</i>	<i>efernand@blm.gov</i>
Oklahoma Field Office (OKFO): Norman, OK		(405) 579-7100	

DRILLING PLAN CONDITIONS OF APPROVAL

I	ADMINISTRATIVE REQUIREMENTS
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1. Contact the BLM Petroleum Engineers listed in the above table if there are any concerns regarding these Drilling Plan Conditions of Approval prior to SPUD Notification during normal business hours
2. After Spud Notification and matters of urgent concern that occur outside of normal business hours shall be directed to Inspection and Enforcement first. The Field Inspector may direct the call to a BLM Engineer if necessary.
3. Notices to BLM Inspection and Enforcement staff, and discussion with BLM Engineers shall be recorded in your daily progress (drilling) report. The name of the BLM staff, the time when they were notified, and the nature of the discussion shall be documented, including any pertinent outcome of the discussion. Unless instructed otherwise, daily drilling reports shall be submitted at the end of drilling operations in the form of a drilling summary; however, daily reports may be requested at any time and shall be available on demand.

4. **Required Testing, Logging, and Coring procedures noted below:**

- Mud Logging/Gamma Ray/MWD.
- Open hole logs (GR/SP/DIL/LDT/CNL/ML) from TD (horizontal well – vertical portion of hole) to the top of the upper most potential hydrocarbon intervals.
- Open hole logs (GR/SP/DIL) from the top of the upper most hydrocarbon interval to the base of the surface casing and (GR) log from base of surface casing to surface.
- Cased hole CBL on production casing.

When logs are run, digital log data must be submitted to this office. **Paper logs will not be accepted.** Log data should be in LAS format (Log ASCII Standard [Canadian Well Log Society Version 1.2, or greater]).

5. A copy of the daily drilling and completion morning reports along with a copy of all the open and cased hole logs shall be submitted to the BLM office 30 days from completion. The completion data reported to the BLM should include the final bottom hole location, treating pressure, pumped volumes, post frac analysis, flow back oil and water volumes and tracer information if available.
6. **Changes to the approved APD casing program** need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).
7. **Casing String Cement Compressive Strength:** After cementing but before commencing any tests, the casing string shall stand cemented until the cement has reached a compressive strength of at least 500 psi at the shoe, and cement has been in place at least 8 hours. During this WOC time, no tests shall be initiated until cement has been in place at least 8 hours; also no drill pipe shall be run in the hole. WOC time shall be recorded in the driller's log. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
8. If applicable, plans for disposal of water produced beyond the drilling and completions phase of this well shall be submitted via Sundry Notice of Intent, Form 3160-5, and must be approved by the Authorized Officer prior to disposal. Please refer to Onshore Oil and Gas Order #7 A. for appropriate disposal methods and approval requirements. 'Unless prohibited by the Authorized Officer, produced water from newly completed wells may be temporarily disposed of into pits for a period of up to 90 days, if the use of the pit was approved as part of an application for permit to drill.
9. If applicable, requests for measurement of produced oil or gas at any location other than on the lease, or within the boundary of a valid Federal or Indian agreement, shall be submitted via Sundry Notice of Intent, Form 3160-5, and must be approved by the Authorized Officer prior to use of any alternative method.

II. Pressure Control

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API 53.

If the operator plans on using a multi-bowl wellhead assembly

2. Operator has proposed a **multi-bowl wellhead assembly**. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **10,000 (10M) psi**.
 - a. Wellhead shall be installed by manufacturer's representatives. Submit documentation with subsequent Sundry Notice.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. **Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.**
 - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
3. **Variance approved to use flex line from BOP to choke manifold.** If you choose to use a flexible hose as opposed to a non-flexible connection between the stack and the choke manifold, the hose must be successfully tested along with the stack over each hole section at the same test pressure of the approved RAM size (RAM test pressure). Check condition of flexible line from BOP to choke manifold and replace if exterior is damaged or if line fails test. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. The manufactures' specification and hydrostatic pressure test certification matching the hose in service information must be available on request to our inspection and enforcement personnel.

If the operator is not using a multi-bowl well head assembly, Items 4 and 5 apply

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5,000 (5M) psi**.
5. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below intermediate casing shoe shall be **10,000(10M) psi**

5M/10M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

6. The BLM office shall be notified as stated in General Conditions of Approval above in advance for a representative to witness the BOP tests. All testing shall comply as described in Onshore Oil and Gas Order No. 2 and API 53

- a. For all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength.
- b. The tests shall be done by an independent service company utilizing a test plug, **not a cup or J-packer**.
- c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- d. The results of the test shall be reported to the appropriate BLM office.
- e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
- f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

III. PRESSURE TESTING ON CASING – AFTER CEMENTING

In accordance with Onshore Oil and Gas Order No. 2, "all casing strings below the conductor shall be pressure tested to 0.22 psi/ft of casing string length, or 1,500 psig, whichever is greater, not to exceed 70% of the minimum internal yield." Variance granted to use 0.22 psi/ft offset exterior gradient for the 70% of the minimum internal yield pressure calculations.

IV. FORMATION TESTING REQUIREMENTS – AFTER DRILLING OUT BELOW SHOE

On all exploratory wells and on that portion of any well approved for a 5M psi BOPE system or greater, a pressure integrity test of the formation (FIT), at each casing shoe (before drilling no more than 20 ft below the casing shoe) shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth (TD) of the well, or to the maximum mud weight listed in the APD to the next setting depth, whichever is greater.

V. OTHER VARIANCES TO BLM ORDERS AND REGULATIONS and COA Requirements

- 1 A variance approved on conditions during testing of intermediate and production casing. Section 8A of drilling program.

2. Intermediate is to be kept liquid filled while running in hole to meet BLM minimum collapse safety factor.
3. **A 10M annular is required on a 10M BOP/BOPE system.** BOP/BOPE diagrams submitted with APD and on rig location shall be functionally equivalent to Onshore Order #2 and to the actual equipment on the drilling rig.
4. Per attached drilling program refer to these COA for the following sections: 8A: Casing Design & Loading, 10: Pressure control and **12: Testing, Logging & Coring.**
5. All casing design changes shall be submitted via NOI Sundry with well bore diagram including running contingency liner and liner hangers.

EGF 02/14/2017



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Oklahoma Field Office
201 Stephenson Parkway, Suite 1200
Norman, Oklahoma 73072
www.blm.gov/nm



ENVIRONMENTAL CONDITIONS OF APPROVAL FOR THE APPLICATION FOR PERMIT TO DRILL

Well Name: HINES FEDERAL 1H-0235X Lease No: OK NM 20396

Location: SHL: 235' FSL & 2410' FEL, (SE $\frac{1}{4}$ SE $\frac{1}{4}$), Sec. 2, T. 10 N., R. 8 W., I.M., Grady County, Oklahoma

BHL: 165' FNL & 1680' FEL, (NW $\frac{1}{4}$ NE $\frac{1}{4}$), Sec. 35, T. 10 N., R. 8 W., I.M., Canadian County, Oklahoma

Operator: CIMAREX ENERGY CO

A COPY OF THESE CONDITIONS OF APPROVAL MUST BE FURNISHED TO YOUR FIELD REPRESENTATIVE

GENERAL CONDITIONS OF APPROVAL [HINES FEDERAL 1H-0235X]

1. **Verbal notification shall be given to the assigned BLM Natural Resource Specialist, at least 48 HOURS PRIOR TO PAD CONSTRUCTION. Refer to page 2 for BLM contact information.**
2. Approval of this APD does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease that would entitle the applicant to conduct operations thereon. In addition, approval of this APD does not imply that the operator has legal access to the drilling location. When crossing private surface 43 CFR 3814 regulations must be complied with and when crossing public surface off-lease the operator must have approved rights-of-way.
3. This APD is valid for two years from the date of approval or until the oil and gas lease expires/terminates, whichever occurs first. If drilling of this permitted well is to result in an extension of the lease term, diligent operations (actual drilling) must be in progress before and continue through the lease expiration date and must continue diligently until well completion, advance lease rentals must have been paid, and a letter stating drilling operations were in progress must be submitted to this office no later than five days past the lease expiration date. If the APD terminates, any surface disturbance created under the application must be reclaimed according to an approved plan.
4. All applicable local, state and/or federal laws, regulations, and/or statutes must be complied with.
5. A complete copy of the approved APD must be at the drill site during the construction of the roads and drill pad, the drilling of the well, and the completion of the well.

BLM Contact Information:

<i>Natural Resource Specialist (NRS)</i>	<i>Mr. Steve (Craig) Willems</i>	<i>(405) 579-7177 office</i>	<i>swillems@blm.gov</i>
<i>Wildlife</i>	<i>Ms. Becky Peters</i>	<i>(405) 579- 7174 office (918) 260-4331 cell</i>	<i>bpeters@blm.gov</i>
<i>Archeology</i>	<i>Ms. Erin Knolles</i>	<i>(405)579-7178 office</i>	<i>eknolles@blm.gov</i>
<i>*NEW Location* Main Number- Norman, OK</i>		<i>(405) 579-7100</i>	

ENVIRONMENTAL CONDITIONS OF APPROVAL [HINES FEDERAL 1H-0235X]

REVIEW AND COMPLY WITH THE FOLLOWING "SPECIAL CONDITIONS OF APPROVAL" FOR THE LIFE OF THIS WELL.

1. As stated in 43 CFR 3162.3 2, the issuance of this APD does not grant, convey, authorize, allow or otherwise imply approval or permission to conduct any associated activities off the approved pad area (i.e. well pad, access road, pipeline easement, utility easement). All surface disturbing activities associated with the drilling of this well will be restricted to the approved areas.
2. If the operator and/or surface owners wants or attempts to change or modify any of the terms and conditions of approval, the applicant/operator must contact the BLM OFO Natural Resource at swillems@blm.gov or telephone at (405-579-7177 or 7100) before considering or implementing any changes or stipulations.
3. Operator shall give at least 48 hours' notice to the Natural Resource Specialist (Craig Willems) via e-mail at swillems@blm.gov or telephone at (405-579-7177 or 7100) prior to any well pad construction or drilling activities.

Archeology/Cultural:

4. If any new discoveries of archaeological material such as flint or stone tools, pottery, human bone, fire hearths, historic glass, ceramics, metal, or building foundations are exposed anytime during exploration operations; then all work at the location of such artifacts shall stop immediately and the operator and its contractors or subcontractors will immediately contact BLM staff archeologist at 918-621-4100, or BLM Multi-Resources Assistant Manager at 918-621-4187; and the State Historical Preservation Office called immediately. No further work at the location of artifacts should begin until the BLM notifies the operator to proceed
 - a. In the event that lease development practices are found in the future to have an adverse effect on significant cultural resources, Traditional Cultural Properties, or paleontological resources, the operator and the BLM, in consultation with the affected tribe(s), the State Historic Preservation Office will take action to mitigate or negate those effects. Measures include, but are not limited to physical barriers to protect resources, relocation of practices responsible for the adverse effects, or other treatments as appropriate.
 - b. All surface disturbances must be kept within the proposed ground disturbance as it currently exists in the APD. Expansion of the pad or widening of the road is prohibited unless expressly authorized by the BLM archaeologist. Any "in kind" land disturbing activities associated with this project at the request of the land owner are prohibited unless cultural clearance is provided and a cultural resources report is submitted by a BLM permitted archaeologist. These activities include but are not limited to: destruction of buildings, improvement of roads, removal of trees, bushes or any clear-cutting, or any other activity that would disturb the ground surface outside of the currently BLM approved areas.

c. These conditions apply as essential terms and conditions of this APD. These requirements are made to comply with Section 106 of the National Historic Preservation Act as amended, the Native American Graves Protection and Repatriation Act, and the Code of Federal Regulations 36 CFR Part 800. Having gone through the permitting process successfully, Cimerax Energy Company is fully aware that any future project that causes ground disturbance prior to a permit being issued by the BLM, will be a violation of NHPA and will be considered Knowing and Willful and may result in a denial of permit and will be forced to remedy any violation regardless of cost.

d. If human remains are discovered the procedures of the Oklahoma Burial Desecration Law (Oklahoma Statute Chapter 47, Section 1168.0 - 1168.6), Texas Health & Safety Code (Section 711.010 Unknown or Abandoned Cemetery), or Kansas Unmarked Burial Sites Statute and Regulations (K. S. A 75-2741) shall apply.

e. This authorization does not permit any surface disturbance on any other Federal or State Surface management agency or private land owners. The operator or their agent is responsible for obtaining permits, permissions, or Rights-of-ways from other surface management agencies prior to any ground disturbance and ensuring that cultural resources surveys are approved by those agencies.

Surface Disturbance:

5. No construction or routine maintenance activities will be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of 6 inches deep, the soil shall be deemed too wet.

6. If soil is removed, at least the top 6 inches of soil material, or whatever salvageable, will be stripped and stockpiled (separate from the spoils pile) on an unutilized construction zone of the well pad. The stockpiled soil material will be spread on the portions of the well pad, which are to be reclaimed (including the cut and fill slopes and all portions of the well pad outside of the production facility) prior to reseeding. Spreading will not be done when the ground or topsoil is frozen or wet.

7. At a minimum, effectively install silt fencing (screening) and/or weed-free hay/straw bales prior to beginning any clearing/construction activities. Silt fencing will be installed (and maintained) adjacent to the entire area to be leveled and cleared (around all construction sites; pad, access road, and pipeline) so as to minimize the movement of materials from the BLM approved areas of surface disturbance to adjacent lands or drainages. Placement should be along all sides of the pad except for those areas needed for vehicular access. The bales need to be installed, maintained, and replaced in such a manner as to provide effective control of any surface runoff and/or erosion that may occur. A double row of hay bales will be used where necessary. These measures will be effectively maintained until the well is in active/production stage or has been plugged and abandoned, and successful stabilization, reclamation and restoration is achieved. These erosion control measures are only needed for the duration of construction, drilling/completion, production (only if ground has not been stabilized), and reclamation as needed to prevent soil movement.

8. The access road and pad may be surfaced with rock aggregate per operator and surface owner's agreement. Surfacing or additional surfacing will be required in the event there is resource or excessive road damage.

Production:

9. All production related facilities/equipment will be painted, and all painted surfaces will be maintained to ensure its integrity, according to API, BLM, and surface owner specifications.

10. A fluid impermeable secondary containment dike/berm will be constructed/placed around any tank battery and facilities according to 40 CFR 112.7. No sumps, pumps, drains, lines or other means will be used to remove/discharge water collected within the secondary containment except to remove for on-site storage/off-site disposal via approved storage tanks and/or transport systems. The dike/berm and the entire containment area will be graveled. A step or walkway will be placed over the dike/berm to gain access to the tank battery.

11. Dike & berm the tank battery that will receive fluids from this well. The dike/berm will be impervious and designed according to requirements of 40 CFR 112. The EPA has a booklet (July 1992) available titled "Information on SPCC Plans – 40 CFR 112." Page 20 of this booklet describes, in detail, how tank battery dikes (berms) are to be constructed.

12. If the well is successful, all production equipment, facilities and tanks including well-head and above-ground piping/equipment shall be properly enclosed to exclude livestock if present.

13. If a compressor or pump-jack shall be used at any point over the life of the well, noise mitigation may be required at the discretion of the landowner. If noise mitigation is required, a 48.6 dB[A] Leq noise level will be enforced 100 feet from a dwelling/home in a direct line between the noise source and the dwelling/home.

14. During production operations the location and access road will be policed and kept free from all debris and garbage.

Reclamation:

15. After plugging operations are complete, and prior to reclamation, all contaminated soil, cables, drums, thread protectors, trash/debris, and unnecessary materials/equipment or imported gravel, etc., shall be removed and hauled to an authorized permitted disposal facility.

16. The entire area will be returned to its original contour or as directed by the surface owner. Stockpiled topsoil will be returned to all disturbed areas or, if needed, clean soil or topsoil would be added. All disturbed areas should be ripped to a depth of 12-24 inches and disked prior to topsoil placement and seeding.

17. Establish vegetation on all areas of the location to be reclaimed. This phase of the reclamation process should be accomplished by using seed or sod. Current policy recommends that these areas be restored with native vegetation in regards to both species and structure (grass, shrubs or trees). In those areas where trees or shrubs are planted, grass should be planted in conjunction to provide stabilization until trees are mature. This recommended reclamation is contingent upon the wishes of the surface owner and/or the surface management agency. Seeding will be repeated if a satisfactory stand is not obtained as determined by the Authorized Officer upon evaluation after the second growing season.

18. Use only certified weed-free seed. It is recommended to use the appropriate seed mixture, according to NRCS site guidelines, for the site unless the surface owner or surface managing agency prefers a different seed mix. Under no circumstances should the seed mixture contain any species listed by the State of Texas as noxious or invasive.

17. All areas of the surface disturbance (i.e. well pad, access road, pipeline, etc.) that are not needed or used in the production or operation of the well shall be reclaimed, immediately as described in the approved APD.

18. After the well is no longer in production, complete reclamation of the site will begin as soon as possible, but in no case longer than sixty (60) days from final plugging of the well and completed within thirty (30) days, weather permitting, unless approved otherwise by the BLM and surface owner.

19. The final fill slope prior to re-seeding will not be steeper than a 3:1 Ratio. To obtain this ratio, pits and slopes will be back-sloped into the pad upon completion of drilling. Construction slopes can be much steeper during drilling, but will be re-contoured to the above ratio during reclamation. Production equipment (including any facilities associated with pipeline construction) will be placed on location as not to interfere with reclaiming the cut and fill slopes to their proper ratio. If equipment is found to interfere with the proper reclamation of the slope, the company will be required to move the equipment so proper re-contouring can occur.

20. Operator must provide proof or certification of water permit for use in project well(s). If the source of water used on the project well(s) changes to a different source from what was analyzed in the original surface use plan; then the proposed new water source is to be submitted to BLM on Sundry Form 3160-5.

Wildlife Resource General Conditions of Approval **(WRGCOAs)**

The Bureau of Land Management (BLM) and the United States Fish and Wildlife Service (Service) have cooperatively developed the following 12 Wildlife Resource General Conditions of Approval (WRGCOA's). These WRGCOA's are conservation measures (CM's) in all of BLM's (in-house) biological evaluations. These required WRGCOA's are Best Management Practices (BMP's) incorporated into all approved permits issued by BLM for mineral extraction projects. The BLM does not normally require certain technologies to accomplish goals; but rather identifies the end goal, allowing the Operator to determine the optimal approach for accomplishing that goal. They are designed to minimize impacts (cumulative and otherwise) to ground water, surface water, wetlands, riparian zones, migratory birds, threatened and/or endangered species and other significant biological resources.

The operator (&/or their assigns) will:

1. **NTL-96-01-TDO:** The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between and among the U.S., Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the MBTA, incidental, unintentional, and accidental take, killing, or possession of a migratory bird or its parts, nests, eggs or products, manufactured or not, without a permit is unlawful. The MBTA has limited provisions for a permitting process which allows for regulated "take" of migratory birds. The BLM requires that the Operator follow all guidelines set forth in the Tulsa District Office Notice to Lessees and Operators (NTL-96-01-TDO) under permits issued by the BLM with the jurisdiction of. This federal and Indian oil and gas leases operating NTL facilitates BLM oil and gas permitted activity through required procedure designed to minimize bird and bat mortality. Modification requirements regarding all open-vent exhaust stacks, open earthen pits, and open-topped tanks are clearly addressed in the NTL-96-01-TDO, and can be found at the following web address:

www.blm.gov/nm/st/en/prog/energy/oil_and_gas/notice_to_lessees/ntl_96-01.html

2. **American Burying Beetle:** Follow all BLM and Service protocol established regarding areas where the American burying beetle (ABB) is known or suspected to exist. The US Fish and Wildlife Service has established a protocol for increasing protection of American burying beetles in areas where they are known to exist and possibly over-winter. The Service is clear regarding ABB protocol, including survey procedures and time/distance regulations. Burying of transmission lines cannot be implemented in known ABB habitat during the over-winter period. The web-site describing ABB protocol is located at:
<http://www.fws.gov/southwest/es/oklahoma/beetle1.htm>

3. **Pipelines and Wetlands:** Specific surface water BMP control measures will be implemented prior to any surface disturbance activity where wetland habitat exists. These BMP control measures will effectively prevent the flow of sediment loaded surface water during rain events into the wetland area. Surface water runoff that can impact wetlands detrimentally include but are not limited to that which runs off lease roads and well pad areas. Consideration must also be given to all pipeline installation in wetland areas. Pipeline installation will be implemented in a manner that does not impact wetland habitat. An example of this would be to bore under encountered wetlands rather than trench through them. It is the Operators responsibility to employ measures that protect wetlands from their activities.
4. **Rapture Protection:** Birds of prey, or raptors, are especially vulnerable to collision and/or electrocution because of their size and hunting behavior. Power poles that have inadequate spacing between the phases (hot wires), or unnecessary grounded metal, can kill raptors. All above ground transmission lines shall be constructed in such a way as to minimize electrocution of birds. This simple measure can be completed through construction of perch guards and the like. Detailed information and additional guidelines can be found in *"Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1981"*, available from the Raptor Research Foundation, Inc. Temporary pipelines or other conduits needed to supply the drilling location with fresh water are not affected by this requirement and may remain on the surface and do not need to be buried.
5. **40 CFR 112:** Properly bermed tank batteries can prevent unnecessary contamination of the surface, surface water pathway, and groundwater. Contamination of any of the pathways can directly impact general wildlife and the environment. The BLM requires the Operator to dike & berm the tank battery that will receive fluids from this well. The dike/berm will be impervious and designed according to requirements of 40CFR 112. The EPA has a booklet (July 1992) available titled *"Information on SPCC Plans – 40 CFR 112"*. Page 20 of this booklet describes, in detail, how tank battery dikes (berms) are to be constructed.
6. **Vegetative Establishment:** The BLM requires the establishment of vegetation on all areas of the location to be reclaimed. This phase of the reclamation process should be accomplished by using seed or sod. Current policy recommends that these areas be restored with native vegetation in regards to both species and structure (grass, shrubs or trees). In those areas where trees or shrubs are planted, grass should be planted in conjunction to provide stabilization until trees are mature. This recommended reclamation is contingent upon the wishes of the surface owner and/or the surface management agency.

7. **Erosion Control:** The BLM requires that erosion control measures prior to beginning any construction activities be effectively employed. These erosion control measures will be installed (and maintained) outside of the entire area to be leveled and cleared (around all construction sites; pad, access road and pipeline) so as to effectively minimize the movement of materials from the BLM permit site to adjacent lands or drainages. These measures will be effectively maintained until the well is producing or has been declared a dry hole and plugged. These erosion control measures are required for the duration of the construction, drilling and completion phases of this project and not for the life of the well.
8. **Impervious Liners:** Drilling operation fluids can contaminate the environment. The BLM requires that the Operator install an impervious liner under the drilling rig structure. Usually this will be the drilling rig substructure, operating equipment (diesel engines) and storage tanks (diesel fuel, lubricants, antifreeze, etc.); not the entire pad. This liner should extend into sumps and the cellar and into and along the ditches to prevent any fluids associated with the drilling process from coming into contact with earthen material. This liner will be washed off into lined ditches, lined sumps or into the lined cellar and then pumped to the lined sumps prior to being removed from the location. Metal catch pans may be used on isolated engines and/or storage tanks where the impervious liner may not be practical. The catch pans, if used, will need to be kept pumped and/or drained (not allowed to overflow). The contents of the metal catch pans may go to the lined sumps, lined cellar or pumped into tanks/trucks for disposal purposes.
9. **Sumps:** To further insure and minimize possible contamination of the environment, the BLM requires that all sumps be lined with impervious material (steel or concrete preferable) on all sides, and bottom. These sumps will, at all times, be below the level of the ditches so that the fluids in the ditches can flow into the sump without coming into contact with native soil or other earthen layer. These sumps must be emptied before overflowing. These sumps will also be covered so as to prevent accidental entry by migratory birds.
10. **Rat and Mouse Hole:** Additional contaminant control is required by making the rat hole and mouse hole impervious. This can be accomplished by installing cylinders (conductors, culverts or tin-horns) with concrete bottoms. The cylinders shall be installed in such a manner so as to prevent fluids from the pad surface from running into the cylinders, or entering between the cylinders and the earthen wall of the rat and/or mouse hole. The top of the cylinder should be above the pad surface. One option is to pour cement around the outside of the cylinders between the cylinders and the earthen hole. The cement could also be shaped/formed at an incline or raised (like a collar) above the ground level. Modifications to this approach shall first be cleared by submitting in writing the alternative method to a BLM staff biologist and engineer for review.

- 11. Drilling Cellar:** The drilling cellar (concrete, metal, etc) must also be lined so as to make it as impervious as possible to prevent liquids discharged from the drill hole, or drained from the pad surface, from percolating into the soil. If needed, a pump will be installed to transfer fluids in the cellar to one of the lined sumps. The cellar will not be allowed to overflow.
- 12. Removal of Impervious Liners:** Improper removal of impervious liners can defeat the purpose of the liner. Exercise caution and care when removing any of the impervious liners (geo-membrane, concrete, steel, etc.). The liquids and solids which have collected on/in the impervious liners will not be allowed to come into contact with the pad surface, parent soil or any other earthen layers during the cleanup of the site. The liners will be properly cleaned prior to removal or removed in such a manner so as not to allow liquids/solids to escape. Preferably the liner will be washed off into lined ditches, lined sumps or into the lined cellar and then pumped to the lined sumps prior to being removed.



In Reply To.
3160

[OKNM28183]

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
OKLAHOMA FIELD OFFICE FIELD OFFICE
201 STEPHENSON PARKWAY SUITE 1200
NORMAN, OK 73072
BLM_NM_OFO_APD@BLM.GOV



03/08/2017

Attn. KIMBERLEIGH RHODES
CIMAREX ENERGY CO
202 S. CHEYENNE AVE., STE 1000
TULSA, OK 74103

Re [OKNM28183]

Well No.	HINES FEDERAL / 1H-0235X
Legal Description:	T10N, R8W, SEC 2, NWNW
County, State.	GRADY, OK
Date APD Received	11/03/2016

Dear Operator:

This is the Notice of Deferral letter pursuant to Onshore Oil and Gas Order, Number 1, Section III.E.2.c.

As the BLM previously stated, the Application for Permit to Drill (APD) submitted for the above referenced well is a complete application. This letter is to inform you that the BLM was not able to complete processing that APD after determining the APD was complete

Reasons for not processing the APD:

The BLM has not been able to complete the following inventories.

- Cultural Resources Inventory

It is estimated that the inventory will take the following number of days : 60

- Surface deferral reasons: Cultural resource review and consultation in process We have a large backlog.

To shorten the processing period, the operator may opt to assist in the completion of these documents.

The BLM has not completed the National Environmental Policy Act (NEPA) analysis. We Anticipate that this analysis will take the following number of days : 60.

- National Environmental Policy Act (NEPA)



Luksa, Melissa <mluksa@blm.gov>

Cimarex Energy - Hines Federal 1H-0235X APD1 message

Kimberleigh Rhodes <KiRhodes@cimarex.com>

Wed, Feb 8, 2017 at 5 35 PM

To: "mluksa@blm.gov" <mluksa@blm.gov>, "Willems, Steven" <swillems@blm.gov>

Cc: Terri Stathem <TStathem@cimarex.com>

Melissa – I wanted to touch base with you regarding this APD, I submitted our deficiency response Friday 2/3 but saw today that it was in my work list again and the changes were not saved. I have resubmitted the APD and as far as I can tell, everything saved and it went through. I also made a few changes based off deficiencies we have received on other applications.

Additional changes made in AFMSS II:

Added Stimulation water source table

Revised production facility diagram to correlate with reclamation

Revised wellpad long term disturbance

If you have any questions, please let me know!

Thank you,

Kimberleigh

Kimberleigh Rhodes

Regulatory Tech

Cimarex Energy Co.

918.560.7081

kirhodes@cimarex.com



United States Department of the Interior



BUREAU OF LAND MANAGEMENT
OKLAHOMA FIELD OFFICE
201 STEPHENSON PARKWAY SUITE 1200
NORMAN, OK 73072
BLM_NM_OFO_APD@BLM.GOV

In Reply To:

3160

[OKNM28183]

01/31/2017

Attn: ARICKA EASTERLING
CIMAREX ENERGY CO
202 S. CHEYENNE AVE., STE 1000
TULSA, OK 74103

Re: Receipt and Acceptability of Application for Permit to Drill (APD)

FEDERAL - OKNM28183

Well Name / Number: **HINES FEDERAL / 1H-0235X**
Legal Description: **T10N, R8W, SEC 2, SWSE**
County, State: **GRADY, OK**
Date APD Received: **11/03/2016**

Dear Operator:

The BLM received your Application for Permit to Drill (APD), for the referenced well, on 11/03/2016. The BLM reviewed the APD package pursuant to part III.B.2 of Onshore Oil and Gas Order No.1 and it is:

1. ☒ Incomplete/Deficient (*The BLM cannot process the APD until you submit the identified items within 45 calendar days of the date of this notice or the BLM will return your APD.*)

- ☐ Well Plat
- ☒ Drilling Plan
- ☐ Surface Use Plan of Operations (SUPO)
- ☐ Certification of Private Surface Owner Access Agreement
- ☐ Bonding
- ☐ Onsite (The BLM has scheduled the onsite to be on _____)
This requirement is exempt of the 45-day timeframe to submit deficiencies. This requirement will be satisfied on the date of the onsite.
- ☒ Other

[Please See Addendum for further clarification of deficiencies]

2. ☐ Missing Necessary Information (*The BLM can start, but cannot complete the analysis until you submit the identified items. This is an early notice and the BLM will restate this in a 30-day deferral letter, if you have not submitted the information at that time. You will have two (2) years from the date of the deferral to submit this information or the BLM will deny your APD.*)

[Please See Addendum for further clarification of deficiencies]

NOTE: The BLM will return your APD package to you, unless you correct all deficiencies identified above (item 1) within 45 calendar days.

- The BLM will not refund an APD processing fee or apply it to another APD for any returned APD.

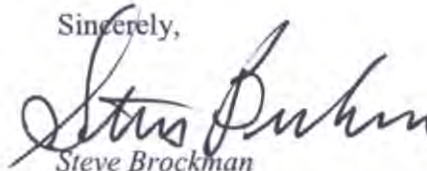
Extension Requests:

- If you know you will not be able to meet the 45-day timeframe for reasons beyond your control, you must submit a written request through email/standard mail for extension prior to the 45th calendar day from this notice, **03/17/2017**.
- The BLM will consider the extension request if you can demonstrate your diligence (providing reasons and examples of why the delay is occurring beyond your control) in attempting to correct the deficiencies and can provide a date by which you will correct the deficiencies. If the BLM determines that the request does not warrant an extension, the BLM will return the APD as incomplete after the 45 calendar days have elapsed.
 - The BLM will determine whether to grant an extension beyond the required 45 calendar days and will document this request in the well file. If you fail to submit deficiencies by the date defined in the extension request, the BLM will return the APD.

APDs remaining Incomplete:

- If the APD is still not complete, the BLM will notify you and allow 10 additional business days to submit a written request to the BLM for an extension. The request must describe how you will address all outstanding deficiencies and the timeframe you request to complete the deficiencies.
 - The BLM will consider the extension request if you can prove your diligence (providing reasons and examples of why the delay is occurring) in attempting to correct the deficiencies and you can provide a date by which you will correct the deficiencies. If the BLM determines that the request does not warrant an additional extension, the BLM will return the APD as incomplete.

If you have any questions, please contact Steven Brockman at (405) 579-7120.

Sincerely,

Steve Brockman

cc:

Adjudication Comments

- Adjudicator additional information:
 1. Submit Geospatial data. Contact Jason Money at djmoney@blm.gov or 405-579-7194 if you have questions.
 2. Submit Surface use agreement.

Engineering Comments

- BOP requirements are not met

A 10M annular is required on a 10M system below the 9-5/8 inch intermediate casing. The unavailability of a 10M annular preventer is not justification to utilize a 5M annular preventer. Recommend operator review Baker Hughes Oil tools catalog and T3 Energy services catalog.
- Testing Program information is inadequate and/or incomplete

The operator is to review and revised the open hole logging plan to run open hole logs from TD (horizontal well vertical portion of hole only) to base of the surface casing and cased hole logs from base of surface casing to surface.
- Engineering Review: Other submitted information are inadequate and/or incomplete
Per Onshore Order #1:

The estimated depth and thickness of formations, members, or zones potentially containing usable water, oil, gas, or prospective valuable deposits etc.. and the operators plans for protecting such resources is not clear. This information is missing for the Tonkawa, Red Fork through the Woodford formations; N/A is unacceptable; are these hydrocarbon or non- hydrocarbon bearing zones. Identify the formations/zones containing usable water and depths; identify base of treatable water.
- Engineering Review: Other identified drilling plan deficiencies

A complete detail casing design will be reviewed during the final engineering review; further requirements may be requested at this time.

Geologic Comments

- The complete logging, coring, and testing program is not adequately described.
- Coring Program Deficiency Information:

No open-hole logging program through upper pay zones is proposed. Please run a standard log suite (SP/DIL/LDT/CNL/ML) on potential productive zones from Red Fork to the KOP.



Luksa, Melissa <mluksa@blm.gov>

Cimarex, Hines Federal EA

3 messages

Willems, Steven <swillems@blm.gov>

Wed, Jan 25, 2017 at 4:03 PM

To: George Thomas <gthomas@blm.gov>, Becky Peters <bpeters@blm.gov>

Cc: Ty Swirin <tswirin@blm.gov>, April Crawley <acrawley@blm.gov>, Rick Wymer <rwymmer@blm.gov>, David <dsimons@blm.gov>, "Russell, Jami" <jlrussel@blm.gov>, Melissa Luksa <mluksa@blm.gov>, "Lee, Christopher" <clee@blm.gov>

Good afternoon,

I have put the draft Hines Federal 1H EA in the No Arc/Bio folder for your review. Please let me know what I need to update or correct.

M:\Tulsa\MultiResources\EPS\NEPA Documents\Pending NEPA\EAs No Arch & Bio

Thank you,
Craig

—
S. Craig Willems
Natural Resource Specialist

Bureau of Land Management

Oklahoma Field Office

201 Stephenson Parkway, Suite 1200

Norman, OK 73072

405-579-7177
swillems@blm.gov

Willems, Steven <swillems@blm.gov>

Thu, Jan 26, 2017 at 7:00 AM

To: Rick Wymer <rwymmer@blm.gov>, "Russell, Jami" <jlrussel@blm.gov>, "Lee, Christopher" <clee@blm.gov>, Melissa Luksa <mluksa@blm.gov>

----- Forwarded message -----

From: **Simons, David** <dsimons@blm.gov>

Date: Wed, Jan 25, 2017 at 5:02 PM

Subject: Re: Cimarex, Hines Federal EA

To: "Willems, Steven" <swillems@blm.gov>

Craig - as far as I know the archaeological survey report has not yet been reviewed, as it was e-mailed December, and it is likely that no consultation with the SHPO or tribes has occurred.

I will look it over,

Dave Simons*Archaeologist**Bureau of Land Management*

New Mexico State Office

301 Dinosaur Trail

PO Box 27115

Santa Fe NM 87502-0115

505-954-2178 Office

505-954-2183 FAX

On Wed, Jan 25, 2017 at 3:49 PM, Willems, Steven <swillems@blm.gov> wrote:

Sorry Dave,

Yes it is the Hines Fed. 1H-0235X. Here are the COAs. Please let me know if you have any questions or concerns.

Have a good evening,
Craig

On Wed, Jan 25, 2017 at 4:17 PM, Simons, David <dsimons@blm.gov> wrote:

Craig - is this the Cimarex BLM Hines Federal 1H-0235X ?

please drop me a note, I am out of the office teleworking this afternoon,,

Dave Simons

Archaeologist

Bureau of Land Management

New Mexico State Office

301 Dinosaur Trail

PO Box 27115

Santa Fe NM 87502-0115

505-954-2178 Office

505-954-2183 FAX

[Quoted text hidden]

[Quoted text hidden]

[Quoted text hidden]

Thomas, George <gthomas@blm.gov>

Thu, Jan 26, 2017 at 9:07 AM

To: "Willems, Steven" <swillems@blm.gov>

Cc: Becky Peters <bpeters@blm.gov>, Ty Swirin <tswirin@blm.gov>, April Crawley <acrawley@blm.gov>, Rick Wymer <rwyrmer@blm.gov>, David <dsimons@blm.gov>, "Russell, Jami" <jlrussel@blm.gov>, Melissa Luksa <mluksa@blm.gov>, "Lee, Christopher" <clee@blm.gov>

The Hines Federal biology is com and the EA is now in the No Arc folder.

George Thomas
Wildlife Biologist / HazMat Coordinator
Bureau of Land Management, Oklahoma Field Office
201 Stephenson Parkway, Suite 1200
Norman, OK 73072
(desk) 405-579-7176
(fax) 405-579-7101
[Quoted text hidden]



APD ID: 10400006204

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Type: CONVENTIONAL GAS WELL

Submission Date: 11/03/2016

Federal/Indian APD: FED

Well Number: 1H-0235X

Well Work Type: Drill

Highlight
All Changes

Application

Section 1 - General

APD ID: 10400006204

BLM Office: TULSA

Federal/Indian APD: FED

Lease number: OKNM20396

Surface access agreement in place?

Agreement in place? NO

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO

Operator letter of designation:

Keep application confidential? YES

Tie to previous NOS? 10400005355

User: Aricka Easterling

Is the first lease penetrated for production Federal or Indian? FED

Lease Acres: 398.05

Allotted?

Federal or Indian agreement:

Reservation:

Submission Date: 11/03/2016

Title: Regulatory Analyst

APD Operator: CIMAREX ENERGY CO

Operator Info

Operator Organization Name: CIMAREX ENERGY CO

Operator Address: 202 S. Cheyenne Ave., Ste 1000

Operator PO Box:

Operator City: Tulsa

State: OK

Operator Phone: (432)620-1936

Operator Internet Address: tstathem@cimarex.com

Zip: 74103

Section 2 - Well Information

Well in Master Development Plan? NO

Well in Master SUPO? NO

Well in Master Drilling Plan? NO

Master Development Plan name:

Master SUPO name:

Master Drilling Plan name:

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: WOODFORD

Pool Name:

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL

Describe other minerals:

Is the proposed well in a Helium production area? N

Use Existing Well Pad? NO

New surface disturbance?

Type of Well Pad: SINGLE WELL

Multiple Well Pad Name:

Number:

Well Class: HORIZONTAL

Number of Legs:

Well Work Type: Drill

Well Type: CONVENTIONAL GAS WELL

Describe Well Type:

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 0.22 Miles

Distance to nearest well: 4261 FT

Distance to lease line: 235 FT

Reservoir well spacing assigned acres Measurement: 640 Acres

Well plat: Hines Fed_Well Location Plat_11-01-2016.pdf

Well work start Date: 02/01/2017

Duration: 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number: 1433

STATE: OKLAHOMA

Meridian: INDIAN

County: GRADY

Latitude: 35.3639478

Longitude: -98.0157043

SHL

Elevation: 1278

MD: 0

TVD: 0

Leg #: 1

Lease Type: FEE

Lease #: FEE

NS-Foot: 235

NS Indicator: FSL

EW-Foot: 2410

EW Indicator: FEL

Twsp: 10N

Range: 8W

Section: 2

Aliquot: SWSE

Lot:

Tract:

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

	STATE: OKLAHOMA	Meridian: INDIAN	County: GRADY
	Latitude: 35.3745775	Longitude: -98.0135769	
KOP	Elevation: -10614	MD: 11892	TVD: 11892
Leg #: 1	Lease Type: FEE	Lease #: FEE	
	NS-Foot: 235	NS Indicator: FSL	
	EW-Foot: 2410	EW Indicator: FEL	
	Twsp: 10N	Range: 8W	Section: 2
	Aliquot: SWSE	Lot:	Tract:
	STATE: OKLAHOMA	Meridian: INDIAN	County: GRADY
	Latitude: 32.370921	Longitude: -98.013276	
PPP	Elevation: -10674	MD: 14700	TVD: 11952
Leg #: 1	Lease Type: FEDERAL	Lease #: OKNM20396	
	NS-Foot: 2263	NS Indicator: FNL	
	EW-Foot: 1674	EW Indicator: FEL	
	Twsp: 10N	Range: 8W	Section: 2
	Aliquot: SWNE	Lot:	Tract:
	STATE: OKLAHOMA	Meridian: INDIAN	County: GRADY
	Latitude: 35.3745775	Longitude: -98.0135769	
PPP	Elevation: -10674	MD: 14700	TVD: 11952
Leg #: 1	Lease Type: FEDERAL	Lease #: OKNM28183	
	NS-Foot: 958	NS Indicator: FNL	
	EW-Foot: 1671	EW Indicator: FEL	
	Twsp: 10N	Range: 8W	Section: 2
	Aliquot: NWNW	Lot:	Tract:
	STATE: OKLAHOMA	Meridian: INDIAN	County: GRADY
	Latitude: 35.3640049	Longitude: -98.0160318	
EXIT	Elevation: -10674	MD: 22071	TVD: 11952
Leg #: 1	Lease Type: FEE	Lease #: FEE	
	NS-Foot: 165	NS Indicator: FNL	
	EW-Foot: 1680	EW Indicator: FEL	

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Twsp: 11N

Range: 8W

Section: 35

Aliquot: NWNE

Lot:

Tract:

STATE: OKLAHOMA

Meridian: INDIAN

County: GRADY

Latitude: 35.3640049

Longitude: -98.0160318

BHL

Elevation: -10674

MD: 22071

TVD: 11952

Leg #: 1

Lease Type: FEE

Lease #: FEE

NS-Foot: 165

NS Indicator: FNL

EW-Foot: 1680

EW Indicator: FEL

Twsp: 11N

Range: 8W

Section: 35

Aliquot: NWNE

Lot:

Tract:

Drilling Plan

Section 1 - Geologic Formations

ID: Surface formation

Name: UNKNOWN

Lithology(ies):

OTHER - Quarternary

Elevation: 1277

True Vertical Depth: 240

Measured Depth: 240

Mineral Resource(s):

USEABLE WATER

Is this a producing formation? N

ID: Formation 1

Name: HEEBNER

Lithology(ies):

Elevation: -5442

True Vertical Depth: 6744

Measured Depth: 6744

Mineral Resource(s):

NONE

Is this a producing formation? N

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

ID: Formation 2

Name: TONKAWA

Lithology(ies):

Elevation: -6050

True Vertical Depth: 7327

Measured Depth: 7327

Mineral Resource(s):

NONE

Is this a producing formation? N

ID: Formation 3

Name: COTTAGE GROVE

Lithology(ies):

Elevation: -6799

True Vertical Depth: 8076

Measured Depth: 8076

Mineral Resource(s):

NONE

Is this a producing formation? N

ID: Formation 4

Name: HOGSHOOTER

Lithology(ies):

Elevation: -7092

True Vertical Depth: 8369

Measured Depth: 8369

Mineral Resource(s):

NONE

Is this a producing formation? N

ID: Formation 5

Name: CHECKERBOARD

Lithology(ies):

Elevation: -7511

True Vertical Depth: 8788

Measured Depth: 8788

Mineral Resource(s):

NONE

Is this a producing formation? N

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

ID: Formation 6

Name: CHEROKEE

Lithology(ies):

Elevation: -8581

True Vertical Depth: 9858

Measured Depth: 9858

Mineral Resource(s):

NONE

Is this a producing formation? N

ID: Formation 7

Name: VERDIGRIS

Lithology(ies):

Elevation: -8690

True Vertical Depth: 9967

Measured Depth: 9967

Mineral Resource(s):

NONE

Is this a producing formation? N

ID: Formation 8

Name: PINK LIME

Lithology(ies):

Elevation: -8954

True Vertical Depth: 10231

Measured Depth: 10231

Mineral Resource(s):

NONE

Is this a producing formation? N

ID: Formation 9

Name: RED FORK

Lithology(ies):

Elevation: -9005

True Vertical Depth: 10282

Measured Depth: 10282

Mineral Resource(s):

NONE

Is this a producing formation? N

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

ID: Formation 10

Name: INOLA

Lithology(ies):

Elevation: -9182

True Vertical Depth: 10459

Measured Depth: 10459

Mineral Resource(s):

NONE

Is this a producing formation? N

ID: Formation 11

Name: ATOKA

Lithology(ies):

Elevation: -9195

True Vertical Depth: 10472

Measured Depth: 10742

Mineral Resource(s):

NONE

Is this a producing formation? N

ID: Formation 12

Name: MORROW

Lithology(ies):

Elevation: -9357

True Vertical Depth: 10634

Measured Depth: 10634

Mineral Resource(s):

NONE

Is this a producing formation? N

ID: Formation 13

Name: CHESTER

Lithology(ies):

Elevation: -9430

True Vertical Depth: 10707

Measured Depth: 10707

Mineral Resource(s):

NONE

Is this a producing formation? N

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

ID: Formation 14

Name: MERAMEC

Lithology(ies):

Elevation: -10350

True Vertical Depth: 11627

Measured Depth: 11627

Mineral Resource(s):

NATURAL GAS

OIL

Is this a producing formation? N

ID: Formation 15

Name: OSAGE

Lithology(ies):

Elevation: -10609

True Vertical Depth: 11886

Measured Depth: 11886

Mineral Resource(s):

NATURAL GAS

OIL

Is this a producing formation? N

ID: Formation 16

Name: WOODFORD

Lithology(ies):

Elevation: -10615

True Vertical Depth: 11892

Measured Depth: 11892

Mineral Resource(s):

NATURAL GAS

OIL

Is this a producing formation? Y

ID: Formation 17

Name: HUNTON

Lithology(ies):

Elevation: -10773

True Vertical Depth: 12050

Measured Depth: 12050

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Mineral Resource(s):

NATURAL GAS

OIL

Is this a producing formation? N

Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M

Rating Depth: 22072

Equipment: Exhibit "E-1". A BOP consisting of three rams, including one blind ram and two pipe rams and one annular preventer. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A rotating head may be installed as needed. A Kelly clock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

Requesting Variance? YES

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached (Please see Exhibit F, F-1, F-2, F-3). The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.

Testing Procedure: BOP's will be tested by an independent service company. The ram preventers, choke manifold, and safety valves will be tested as follows: On the surface casing, pressure tests will be made to 250 psi low and 3000 psi high. On the intermediate casing, pressure tests will be made to 250 psi low and 10000 psi high. The Annular Preventer will be tested to 250 psi low and 1500 psi high on the surface casing and 250 psi low and 5000 psi high on the intermediate casing.

Choke Diagram Attachment:

Exhibit E-1 - Choke Manifold_11-01-2016.pdf

BOP Diagram Attachment:

Exhibit E-1 - BOP_11-01-2016.pdf

Pressure Rating (PSI): 5M

Rating Depth: 10654

Equipment: Exhibit "E-1". A BOP consisting of three rams, including one blind ram and two pipe rams and one annular preventer. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A rotating head may be installed as needed. A Kelly clock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

Requesting Variance? YES

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached (Please see Exhibit F, F-1, F-2, F-3). The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.

Testing Procedure: BOP's will be tested by an independent service company. The ram preventers, choke manifold, and safety valves will be tested as follows: On the surface casing, pressure tests will be made to 250 psi low and 3000 psi high. On the intermediate casing, pressure tests will be made to 250 psi low and 10000 psi high. The Annular Preventer will be tested to 250 psi low and 1500 psi high on the surface casing and 250 psi low and 5000 psi high on the intermediate casing.

Choke Diagram Attachment:

Exhibit E-1 - Choke Manifold_11-01-2016.pdf

BOP Diagram Attachment:

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Exhibit E-1 - Choke Manifold_11-01-2016.pdf

Exhibit E-1 - BOP_11-01-2016.pdf

Section 3 - Casing

String Type: SURFACE

Other String Type:

Hole Size: 17.5

Top setting depth MD: 0

Top setting depth TVD: 0

Top setting depth MSL: -10674

Bottom setting depth MD: 1500

Bottom setting depth TVD: 1500

Bottom setting depth MSL: -12174

Calculated casing length MD: 1500

Casing Size: 13.375

Other Size

Grade: J-55

Other Grade:

Weight: 54.5

Joint Type: STC

Other Joint Type:

Condition: NEW

Inspection Document:

Standard: API

Spec Document:

Tapered String?: N

Tapered String Spec:

Safety Factors

Collapse Design Safety Factor: 1.72

Burst Design Safety Factor: 4.18

Joint Tensile Design Safety Factor type: BUOYANT

Joint Tensile Design Safety Factor: 7.21

Body Tensile Design Safety Factor type: BUOYANT

Body Tensile Design Safety Factor: 7.21

Casing Design Assumptions and Worksheet(s):

Hines Fed_Casing Assumptions Wksht_11-01-2016.pdf

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

String Type: INTERMEDIATE

Other String Type:

Hole Size: 12.25

Top setting depth MD: 0

Top setting depth TVD: 0

Top setting depth MSL: -10674

Bottom setting depth MD: 10654

Bottom setting depth TVD: 10654

Bottom setting depth MSL: -21328

Calculated casing length MD: 10654

Casing Size: 9.625

Other Size

Grade: L-80

Other Grade:

Weight: 40

Joint Type: LTC

Other Joint Type:

Condition: NEW

Inspection Document:

Standard: API

Spec Document:

Tapered String?: N

Tapered String Spec:

Safety Factors

Collapse Design Safety Factor: 0.61

Burst Design Safety Factor: 1.13

Joint Tensile Design Safety Factor type: BUOYANT

Joint Tensile Design Safety Factor: 1.71

Body Tensile Design Safety Factor type: BUOYANT

Body Tensile Design Safety Factor: 1.71

Casing Design Assumptions and Worksheet(s):

Hines Fed_Casing Assumptions Wksht_11-01-2016.pdf

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

String Type: PRODUCTION

Other String Type:

Hole Size: 8.75

Top setting depth MD: 0

Top setting depth TVD: 0

Top setting depth MSL: -10674

Bottom setting depth MD: 11387

Bottom setting depth TVD: 11387

Bottom setting depth MSL: -22061

Calculated casing length MD: 11387

Casing Size: 5.5

Other Size

Grade: P-110

Other Grade:

Weight: 20

Joint Type: LTC

Other Joint Type:

Condition: NEW

Inspection Document:

Standard: API

Spec Document:

Tapered String?: N

Tapered String Spec:

Safety Factors

Collapse Design Safety Factor: 1.39

Burst Design Safety Factor: 1.47

Joint Tensile Design Safety Factor type: BUOYANT

Joint Tensile Design Safety Factor: 2.89

Body Tensile Design Safety Factor type: BUOYANT

Body Tensile Design Safety Factor: 2.89

Casing Design Assumptions and Worksheet(s):

Hines Fed_Casing Assumptions Wksht_11-01-2016.pdf

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

String Type: PRODUCTION

Other String Type:

Hole Size: 8.75

Top setting depth MD: 11387

Top setting depth TVD: 11387

Top setting depth MSL: -22061

Bottom setting depth MD: 22072

Bottom setting depth TVD: 11952

Bottom setting depth MSL: -22626

Calculated casing length MD: 10685

Casing Size: 5.5

Other Size

Grade: P-110

Other Grade:

Weight: 20

Joint Type: BUTT

Other Joint Type:

Condition: NEW

Inspection Document:

Standard: API

Spec Document:

Tapered String?: N

Tapered String Spec:

Safety Factors

Collapse Design Safety Factor: 1.32

Burst Design Safety Factor: 1.47

Joint Tensile Design Safety Factor type: BUOYANT

Joint Tensile Design Safety Factor: 56.73

Body Tensile Design Safety Factor type: BUOYANT

Body Tensile Design Safety Factor: 56.73

Casing Design Assumptions and Worksheet(s):

Hines Fed_Casing Assumptions Wksht_11-01-2016.pdf

Section 4 - Cement

Casing String Type: SURFACE

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Stage Tool Depth:

Lead

Top MD of Segment: 0

Bottom MD Segment: 1500

Cement Type: Class A

Additives: 2% CaCl, LCM

Quantity (sks): 622

Yield (cu.ff./sk): 2.01

Density: 12.8

Volume (cu.ft.): 1250

Percent Excess: 50

Tail

Top MD of Segment: 0

Bottom MD Segment: 1500

Cement Type: Class C

Additives: LCM

Quantity (sks): 195

Yield (cu.ff./sk): 1.34

Density: 14.8

Volume (cu.ft.): 260

Percent Excess: 25

Casing String Type: INTERMEDIATE

Stage Tool Depth:

Lead

Top MD of Segment: 0

Bottom MD Segment: 10654

Cement Type: 35:65(poz/H)

Additives: Salt, Sodium Metasilate,
Bentonite, Fluid Loss, Dispersant, LCM,
Retarder

Quantity (sks): 354

Yield (cu.ff./sk): 2.4

Density: 11.9

Volume (cu.ft.): 848

Percent Excess: 50

Tail

Top MD of Segment: 0

Bottom MD Segment: 10654

Cement Type: Class H

Additives: Fluid Loss, Retarder

Quantity (sks): 165

Yield (cu.ff./sk): 1.07

Density: 16.4

Volume (cu.ft.): 176

Percent Excess: 25

Casing String Type: PRODUCTION

Stage Tool Depth:

Lead

Top MD of Segment: 0

Bottom MD Segment: 11387

Cement Type: Class C

Additives: LCM

Quantity (sks): 2587

Yield (cu.ff./sk): 1.34

Density: 14.8

Volume (cu.ft.): 3466

Percent Excess: 20

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Stage Tool Depth:

Lead

Top MD of Segment: 11387

Bottom MD Segment: 22072

Cement Type: Class C

Additives: LCM

Quantity (sks): 2587

Yield (cu.ft./sk): 1.34

Density: 14.8

Volume (cu.ft.): 3466

Percent Excess: 20

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials will be kept on location at all times in order to combat lost circulation or unexpected kicks. In order to run DSTs, open hole logs, and casing, the viscosity and water loss may have to be adjusted in order to meet these needs.

Describe the mud monitoring system utilized: Electronic Pason System

Circulating Medium Table

Top Depth: 0

Bottom Depth: 1500

Mud Type: SPUD MUD

Min Weight (lbs./gal.): 7.9

Max Weight (lbs./gal.): 8.4

Density (lbs/cu.ft.):

Gel Strength (lbs/100 sq.ft.):

PH:

Viscosity (CP):

Filtration (cc):

Salinity (ppm):

Additional Characteristics:

Top Depth: 1500

Bottom Depth: 10654

Mud Type: WATER-BASED MUD

Min Weight (lbs./gal.): 8.7

Max Weight (lbs./gal.): 9.2

Density (lbs/cu.ft.):

Gel Strength (lbs/100 sq.ft.):

PH:

Viscosity (CP):

Filtration (cc):

Salinity (ppm):

Additional Characteristics:

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Top Depth: 10654

Bottom Depth: 22072

Mud Type: OIL-BASED MUD

Min Weight (lbs./gal.): 13

Max Weight (lbs./gal.): 13.5

Density (lbs/cu.ft.):

Gel Strength (lbs/100 sq.ft.):

PH:

Viscosity (CP):

Filtration (cc):

Salinity (ppm):

Additional Characteristics:

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

No DST Planned

List of open and cased hole logs run in the well:

DS,GR

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 8390

Anticipated Surface Pressure: 5760.56

Anticipated Bottom Hole Temperature(F): 214

Anticipated abnormal pressures, temperatures, or potential geologic hazards? YES

Describe:

Over-pressured zones are possible from the Oswego through the Mississippi Lime (Meramec and Osage Groups). The Morrow and Springer sandstones may contain the highest possible pressure at approximately 14.5 ppg EMW (1.73x hydrostatic pressure (0.434-psi/foot distilled water) with possible reservoirs of isolated stream- or distributary-channels. Pressure was found in nine section area based on offset DST data.

Lost Circulation Zones of Permian Evaporates (Blaine Anhydrite through the Wellington Evaporates are intermittent from 230-foot-of-depth through 3,300-foot-of-depth). Lost Circulation is can also occur in the Cottage Grove interval in the area.

Contingency Plans geohazards description:

Sufficient barite material will be available if pressure is encountered. Cimarex also has contingency liner and liner hanger on stand-by if needed to cover up encountered pressure that is deemed too risky to move forward with the drilling of the well. Sufficient LCM material will be on location if lost circulation is encountered. Additional drilling fluid will be stored on location at all times in addition to the drilling rig pit system. Drilling fluid can be mixed on location or mixed in vendor mud plant and trucked to location if needed.

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? NO

Hydrogen sulfide drilling operations plan:

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Hines Fed_Directional Prelim_11-03-2016.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Exhibit D- Rig Layout_11-01-2016.pdf

Hines Fed_Drilling Plan_11-01-2016.pdf

Other Variance attachment:

Exhibit F, 1, 2, 3 - Flex hose_11-01-2016.pdf

SUPO

Section 1 - Existing Roads

Will existing roads be used? NO

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

Hines Fed_ Lease Road plat_11-01-2016.pdf

New road type: COLLECTOR

Length: 35 **Feet** **Width (ft.):** 20

Max slope (%): 2 **Max grade (%):** 6

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 14

New road access erosion control: The side slopes of any drainage channels or swales that are crossed will be re-contoured to original grade and compacted and mulched as necessary to avoid erosion. Where steeper slopes cannot be avoided, water bars or silt fence will be constructed, mulch/rip-rap applied, or other measures employed as necessary to control erosion. Hay bales, straw wattles or silt fence may also be installed to control erosion as needed. All disturbed areas will be seeded with a mix appropriate for the area unless specified otherwise by the landowner.

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Access surfacing type: GRAVEL

Access topsoil source: ONSITE

Access surfacing type description:

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Push off and stockpile alongside the location.

Access other construction information: The operator will prevent and abate fugitive dust as needed, whether created by vehicular traffic, equipment operations or other events.

Access miscellaneous information:

Number of access turnouts:

Access turnout map:

Drainage Control

New road drainage crossing: CULVERT,LOW WATER

Drainage Control comments: To control and prevent potentially contaminated precipitation from leaving the pad site, a perimeter berm and settlement pond will be installed. Contaminated water will be removed from pond, stored in waste tanks, and disposed of at a state approved facility. Standing water or puddles will not be allowed. Drainage ditches would be established and maintained on the pad and along access roads to divert water away from operations. Natural drainage areas disturbed during construction would be re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured, and reclaimed to near original condition to re-establish natural drainage.

Road Drainage Control Structures (DCS) description: n/a

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

Exhibit A - One mile radius and existing wells_09-30-2016.pdf

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Existing Wells description:

Section 4 - Location of Existing and/or Proposed Production Facilities

Submit or defer a Proposed Production Facilities plan? SUBMIT

Estimated Production Facilities description:

Production Facilities description: If upon completion the well is a producer, a production facility battery will be constructed and production equipment installed at the wellsite.

Production Facilities map:

Hines Fed_Production Facilities_11-01-2016.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Water source use type: INTERMEDIATE/PRODUCTION CASING,
SURFACE CASING

Water source type: OTHER

Describe type: Fresh water River

Source latitude:

Source longitude:

Source datum:

Water source permit type: TEMPORARY WATER USE PERMIT

Source land ownership: PRIVATE

Water source transport method: PIPELINE,TRUCKING

Source transportation land ownership: PRIVATE

Water source volume (barrels): 5000

Source volume (acre-feet): 0.6444655

Source volume (gal): 210000

Water source and transportation map:

Hines Fed_Water Route_11-01-2016.pdf

Water source comments:

New water well? NO

New Water Well Info

Well latitude:

Well Longitude:

Well datum:

Well target aquifer:

Est. depth to top of aquifer(ft):

Est thickness of aquifer:

Aquifer comments:

Aquifer documentation:

Well depth (ft):

Well casing type:

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Well casing outside diameter (in.):

Well casing inside diameter (in.):

New water well casing?

Used casing source:

Drilling method:

Drill material:

Grout material:

Grout depth:

Casing length (ft.):

Casing top depth (ft.):

Well Production type:

Completion Method:

Water well additional information:

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

Construction Materials description: The drilling and testing operations will be conducted on a watered and compacted native soil grade. Soft spots will be covered with scoria, free of large rocks (3" diameter). Upon completion as a commercial producer the location will be covered with scoria, free of large rocks (3" dia.) from an existing privately owned gravel pit.

Construction Materials source location attachment:

Hines Fed_Construction Source_11-03-2016.pdf

Section 7 - Methods for Handling Waste

Waste type: GARBAGE

Waste content description: Garbage and trash produced during drilling and completion operations

Amount of waste: 32500 pounds

Waste disposal frequency : Weekly

Safe containment description: N/A

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: Zollie L. Farris Trash Hauling Hauls Trash to OEMA landfill in El Reno/Elk City, OK

Waste type: DRILLING

Waste content description: Drilling Fluids, drill cuttings, water and other waste produced from the well during drilling operations.

Amount of waste: 15000 barrels

Waste disposal frequency : One Time Only

Safe containment description: N/A

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Disposal type description:

Disposal location description: Soil Farming mud disposal

Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit?

Reserve pit length (ft.) Reserve pit width (ft.)

Reserve pit depth (ft.) Reserve pit volume (cu. yd.)

Is at least 50% of the reserve pit in cut?

Reserve pit liner

Reserve pit liner specifications and installation description

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? NO

Description of cuttings location

Cuttings area length (ft.) Cuttings area width (ft.)

Cuttings area depth (ft.) Cuttings area volume (cu. yd.)

Is at least 50% of the cuttings area in cut?

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

Hines Fed_Well Location Plat_11-01-2016.pdf

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: NEW

Recontouring attachment:

Hines Fed_ Interim Reclamation_11-01-2016.pdf

Drainage/Erosion control construction: To control and prevent potentially contaminated precipitation from leaving the pad site, a perimeter berm and settlement pond will be installed. Contaminated water will be removed from pond, stored in waste tanks, and disposed of at a state approved facility. Standing water or puddles will not be allowed. Drainage ditches would be established and maintained on the pad and along access roads to divert water away from operations. Natural drainage areas disturbed during construction would be re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured, and reclaimed to near original condition to re-establish natural drainage.

Drainage/Erosion control reclamation: All disturbed and re-contoured areas would be reseeded according to specifications. Approved seed mixtures would be certified weed free and consist of grasses, forbs, or shrubs similar to the surrounding area. Compacted soil areas may need to be obliterated and reclaimed to near natural conditions by re-contouring all slopes to facilitate and re-establish natural drainage.

Wellpad long term disturbance (acres): 3.21

Wellpad short term disturbance (acres): 3.21

Access road long term disturbance (acres): 0.024

Access road short term disturbance (acres): 0.024

Pipeline long term disturbance (acres): 10.918733

Pipeline short term disturbance (acres): 10.918733

Other long term disturbance (acres): 0

Other short term disturbance (acres): 0

Total long term disturbance: 14.152733

Total short term disturbance: 14.152733

Reconstruction method: After well plugging, all disturbed areas would be returned to the original contour or a contour that blends with the surrounding landform including roads unless the surface owner requests that they be left intact. In consultation with the surface owners it will be determined if any gravel or similar materials used to reinforce an area are to be removed, buried, or left in place during final reclamation. Salvaged topsoil, if any, would be re-spread evenly over the surfaces to be re-vegetated. As necessary, the soil surface would be prepared to provide a seedbed for re-establishment of desirable vegetation. Site preparation may include gouging, scarifying, dozer track-walking, mulching, or fertilizing.

Reclamation, Re-vegetation, and Drainage: All disturbed and recontoured areas would be reseeded using techniques outlined under Phase I and II of this plan or as specified by the land owner. Approved seed mixtures would be certified weed free and consist of grasses, forbs, or shrubs similar to the surrounding area. Compacted soil areas may need to be obliterated and reclaimed to near natural conditions by re-contouring all slopes to facilitate and re-establish natural drainage.

Topsoil redistribution: Salvaged topsoil, if any, would be re-spread evenly over the surfaces to be re-vegetated.

Soil treatment: As necessary, the soil surface would be prepared to provide a seedbed for re-establishment of desirable vegetation. Site preparation may include gouging, scarifying, dozer track-walking, mulching or fertilizing.

Existing Vegetation at the well pad:

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road:

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline:

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances:

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed type:

Seed source:

Seed name:

Source name:

Source address:

Source phone:

Seed cultivar:

Seed use location:

PLS pounds per acre:

Proposed seeding season:

Seed Summary

Total pounds/Acre:

Seed Type	Pounds/Acre
-----------	-------------

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name:

Last Name:

Phone:

Email:

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: N/A

Weed treatment plan attachment:

Monitoring plan description: N/A

Monitoring plan attachment:

Success standards: N/A

Pit closure description: N/A

Pit closure attachment:

Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Fee Owner: Bob Hines

Fee Owner Address: 137 County St 2750

Phone: (405)352-4929

Email:

Surface use plan certification:

Surface use plan certification document:

Surface access agreement or bond:

Surface Access Agreement Need description:

Surface Access Bond BLM or Forest Service:

BLM Surface Access Bond number:

USFS Surface access bond number:

Section 12 - Other Information

Right of Way needed? NO

Use APD as ROW?

ROW Type(s):

ROW Applications

SUPO Additional Information:

Use a previously conducted onsite? YES

Previous Onsite information: Onsite with BLM (Craig Willems) and Cimarex (Mike Unruh) Oct 18, 2016.

Other SUPO Attachment

Hines Fed_ SUPO_11-01-2016.pdf

Hines Fed Gas Pipeline Plat_11-01-2016.pdf

Hines Fed_Topo and Vicinity plat_11-01-2016.pdf

Hines Fed_Lease Plat_11-01-2016.pdf

Hines Fed_Payment_11-01-2016.pdf

Hines Fed_Surf Access Agmt and Certification_11-02-2016.pdf

Hines Fed_Wellsite location and Contours plat_11-03-2016.pdf

PWD

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number:

Injection well name:

Assigned injection well API number?

Injection well API number:

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

Other regulatory requirements attachment:

Bond Info

Bond Information

Federal/Indian APD: FED

BLM Bond number: COB000011

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment:

Operator Certification

Operator Certification

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

NAME: Aricka Easterling

Signed on: 11/01/2016

Title: Regulatory Analyst

Street Address: 202 S. Cheyenne Ave, Ste 1000

City: Tulsa

State: OK

Zip: 74103

Phone: (918)560-7060

Email address: aeasterling@cimarex.com

Field Representative

Representative Name:

Street Address:

Operator Name: CIMAREX ENERGY CO

Well Name: HINES FEDERAL

Well Number: 1H-0235X

City:

State:

Zip:

Phone:

Email address:

Payment Info

Payment

APD Fee Payment Method: PAY.GOV

pay.gov Tracking ID: 25UP3TP3

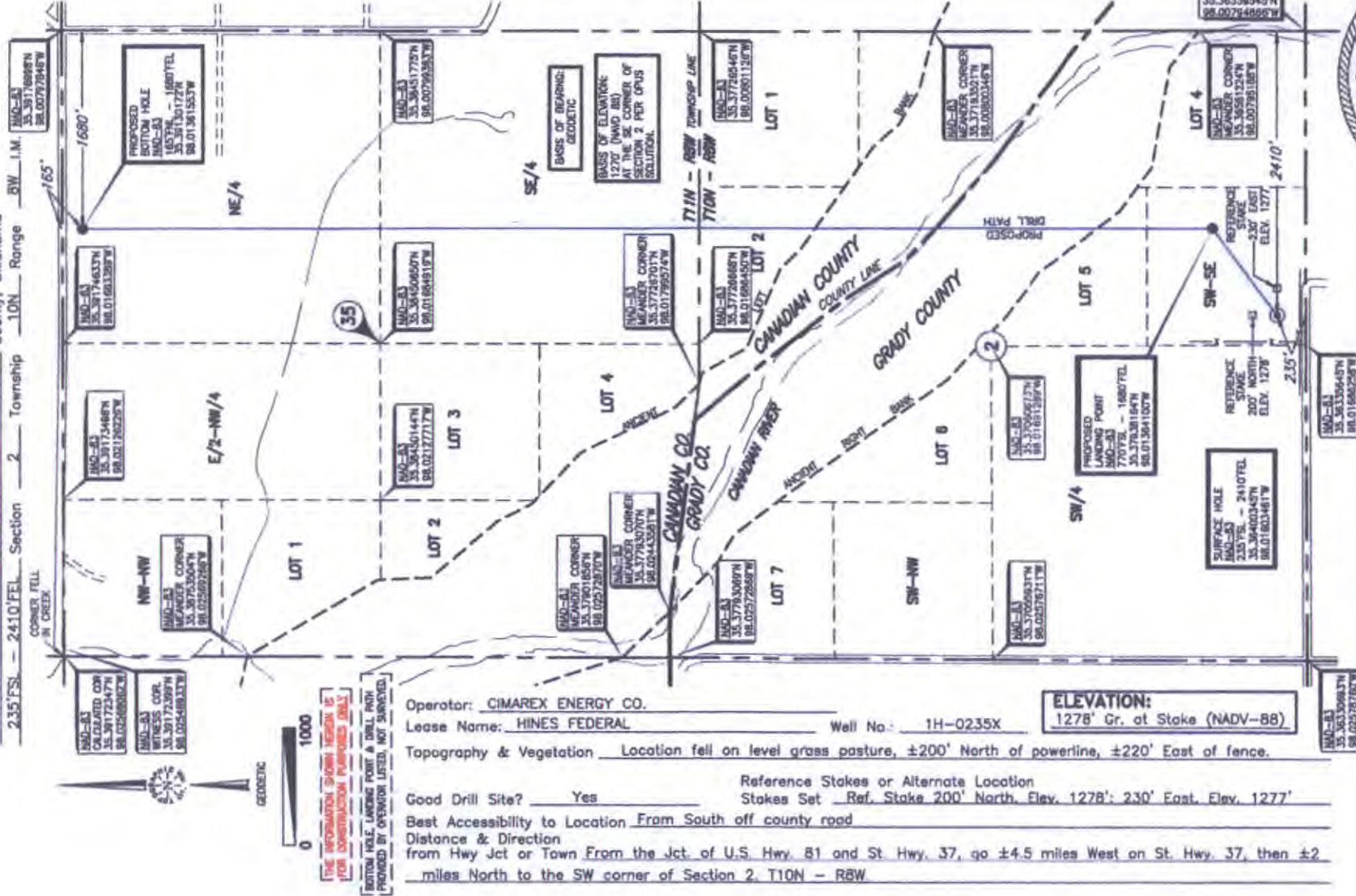
8708 NORTH CLAS.

(00) 854-3219

GRAPHIC LAND SURVEYORS OF OKLAHOMA

A, OKLA. CITY, OKLA. 73118 • LOCAL (405) 843-4847 • OUT OF STATE (800) 854-3219

County, Oklahoma
Grady
Section 2 Township 10N Range 16E



CERTIFICATE:

I, Thomas L. Howell, a Oklahoma Licensed Land Surveyor and an authorized agent of Topographic Land Surveyors of Oklahoma, do hereby certify to the information shown herein.

DATUM: NAD-83

LONG: 98.01803461°W

Lat: 35.36400345°N

This information was obtained with GPS surveying with a1 last half year correction

Oklahoma Lic. No. 1433

Revision 1.1 Date of Drawing: October 25, 2016
 Invoice # 266133 Date Staked: October 10, 2016 JGW

8700 NORTH CLASS.

GRAPHIC LAND SURVEYORS OF OKLAHOMA

J. OKLA. CITY, OKLA. 73116 * LOCAL (405) 843-4847 * OUT OF ST.

JO 804-3219

Grady County, Oklahoma

235' FSL - 2410' FEL Section 2 Township 10N Range 8W 1.M. NW 1/4 NE 1/4

CORNER FILL IN CREEK



Operator: CIMAREX ENERGY CO.

Lease Name: HINES FEDERAL

Well No.: 1H-0235X

ELEVATION:

1278' Gr. at Stake (NAOV-88)

Topography & Vegetation Location fell on level grass pasture, $\pm 200'$ North of powerline, $\pm 220'$ East of fence.

Good Drill Site? Yes

Reference Stakes or Alternate Location

Stakes Set Ref. Stake 200' North, Elev. 1278'; 230' East, Elev. 1277'

Best Accessibility to Location From South off county road

Distance & Direction

from Hwy Jct or Town From the Jct. of U.S. Hwy. 81 and St. Hwy. 37, go ± 4.5 miles West on St. Hwy. 37, then ± 2 miles North to the SW corner of Section 2, T10N - R8W

Revision # 266133 Date of Drawing: October 25, 2016 Date Staked: October 10, 2016 JOW

CERTIFICATE:

I, Thomas L. Howell, a Oklahoma Licensed Land Surveyor and an authorized agent of Topographic Land Surveyors of Oklahoma, do hereby certify to the information shown herein.

DATUM: NAD-83

LAT: 35.364003457N

LONG: 98.016034617W

This information was collected with a GPS receiver with 81 feet Horiz./Vert. accuracy

Oklahoma Lic. No. 1433



Application to Drill
Hines Federal 1H-0235X
 Cimarex Energy Co
 Sec 2, 10N, 8W
 Grady Co, OK

In response to questions asked under Section II B of Bulletin NTL-6, the following information is provided for your consideration

1. Location: SHL 235 FLS & 2410 FEL ; Sec 2-10N-8W
 BHL 165 FNL & 1680 FEL , Sec 35-11N-8W

2. Elevation Above Sea Level: 1,277' GR

3. Geologic Name of Surface Formation: Quaternary Alluvium Deposits

4. Drilling Tools and Associated Equipment: Conventional rotary drilling rig using fluid as a circulating medium for solids removal

5. Proposed Drilling Depth: 22,072 MD 11,952 TVD Pilot Hole TD N/A

6. Estimated Tops of Geological Markers:

Formation	Est Top	Bearing
Quaternary	240	Base of Treatable Water
TONKAWA	7327	Hydrocarbon
HOGSHOOTER	8369	Hydrocarbon
CHEROKEE	9858	Hydrocarbon
RED FORK ZONE	10282	Hydrocarbon
ATOKA	10472	Hydrocarbon
MORROW SHALE	10634	Non-hydrocarbon
CHESTER	10707	Hydrocarbon
MERAMEC	11627	Hydrocarbon
OSAGE	11886	Hydrocarbon
WOODFORD /SH/	11892	Hydrocarbon
WDFD_LANDING_ZONE	11952	Hydrocarbon
HUNTON	12050	Hydrocarbon

7. Possible Mineral Bearing Formation: Shown above

7A. OWRB Base of Treatable Water: 240'

Oklahoma Corporation Commission requires surface casing to be set between 50' and 250' below base of treatable water, Cimarex proposes to set the surface casing at 1500' and use 13-3/8" casing. An Oklahoma Corporation Commission casing exception will be obtained.

8. Casing Program:

Name	Casing Depth From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Open Hole Size (inches)	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	BHP (psig)	Anticipated Mud Weight (ppg)	Collapse SF at Full Evacuation(1.125)	Collapse SF at 1/3 Evacuation(1.125)	Burst SF (1.125)	Cumulative Air Weight	Cumulative Buoyed Weight (lbs)	Buoyant Tension SF (1.8)
Surface	0	1500	1500	17 1/2	13-3/8"	54.50	J-55	ST&C	New	655	8.4	1.72		4.18	81,750	71,266	7.21
Intermediate	0	10654	10654	12 1/4	9-5/8"	40.00	L-80	LT&C	New	5096	9.2		1.62	1.13	426,160	366,302	1.98
Production	0	11387	11387	8 3/4	5-1/2"	20.00	P-110	LT&C	New	7993	13.5	1.39		1.58	239,040	189,772	2.89
Production	11387	22072	11952	8 3/4	5-1/2"	20.00	P-110	BT&C	New	8390	13.5	1.32		1.47	11,300	8,971	71.45

Note: Operator may drill an 8-1/2" OH from end of curve to TD of the well. This is to reduce the need to ream the conventionally drilled curve to run a RSS assembly into the lateral.

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 Cimarex Energy Co.
 Sec. 2, 10N, 8W
 Grady Co., OK

8A. Casing Design and Casing Loading Assumptions:

Surface	Tension	A 1.8 design factor with effects of buoyancy: 8.40 ppg.
	Collapse	A 1.125 design factor with full internal evacuation and a collapse force equal to a 8.40 ppg mud gradient.
	Burst	A 1.125 design factor with a surface pressure equal to the anticipated BHP at setting depth. No backup or gas gradient assumed.
Intermediate	Tension	A 1.8 design factor with effects of buoyancy: 9.20 ppg.
	Collapse	A 1.125 design factor evacuated 1/3 TVD of next casing string with a collapse force equal to a 9.20 ppg mud gradient. During the running of the casing, the operator will stop and fill the casing as need to ensure it does not collapse.
	Burst	A 1.125 design factor with a surface pressure equal to the anticipated BHP at setting depth. No backup or gas gradient assumed.
Production and/or Production Completion System	Tension	A 1.8 design factor with effects of buoyancy: 13.50 ppg.
	Collapse	A 1.125 design factor with full internal evacuation of next casing string with a collapse force equal to a 13.50 ppg mud gradient.
	Burst	A 1.125 design factor with a surface pressure equal to the anticipated BHP at setting depth. No backup or gas gradient assumed.

Operator requests a variance on conditions during testing of the intermediate and production casing to reflect an annulus back up to stay under the 70% Burst consideration. Back up will not exceed 0.432 psi/ft (8.32 ppg).

Example: Maximum MW for the production is 13.5 ppg. To perform an FIT with a 9.4 ppg mud in the hole, 2,274 psi is needed (10,664' TVD). This exceeds the 70% of burst pressure at 10,654' TVD by 3,454 psi. In this case, a variance of 0324 psi/ft backup would be needed to meet the 70% of burst criterion. The actual variance would vary depending on actual wellbore conditions but will not exceed 0.432 psi/ft as mentioned above.

No FIT on the intermediate hole section since equivalent surface pressures required will be 100 psi or less. Perform FIT after drilling out of intermediate casing to max anticipated MW (~13.5ppg in this area).

Estimated fracture Gradient at surface shoe is 12 ppg. Estimated fracture Gradient at intermediate shoe is 15 ppg

										Capacity	
Size, in	Weight, #/ft	Grade	Thread	I.D., in	Drift I.D. in	Cplg O.D., in	Burst, psi	Collapse, psi	Tension, lbs	Bbls/ft	cu. ft./ft/
13 3/8	54.5	J55	STC	12.615	12.459	14.375	2,730	1,130	514,000	0.1546	0.8680
9 5/8	40.0	L80	LTC	8.835	8.750	10.625	5,750	3,090	737,000	0.0758	0.4257
5 1/2	20.0	P110	LTC	4.778	4.653	6.050	12,630	11,080	548,000	0.0222	0.1245
5 1/2	20.0	P110	BTC	4.778	4.653	6.050	12,360	11,080	641,000	0.0222	0.1245

9. Cementing Program:

Casing Type	Type	Sacks	Yield	Weight	Cubic Feet	Cement Blend
Surface	Lead	622	2.01	12.80	1250	Class A + 2% CaCl + LCM, 10.350 gps water
	Tail	195	1.34	14.80	260	Class C + LCM, 6.320 gps water
	TOC: 0		45% Excess			Centralizers per Onshore Order 2.III.B.1f
Intermediate	Lead	354	2.40	11.90	848	35:65 (poz/H) + Salt + Sodium Metasilicate + Bentonite + Fluid Loss + Dispersant + LCM + Retarder, 13.800 gps water
	Tail	165	1.07	16.40	176	Class H + Fluid Loss + Retarder, 4.420 gps water
	TOC: 8400		46% Excess			
Production	Tail	2587	1.34	14.80	3466	Class C + LCM, 6.320 gps water
	TOC: 9600		20% Excess			No centralizers planned in the lateral section. Every other joint from EOC to KOP. 1 every 4th joint from KOP to 500' inside previous casing.

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Cimarex Energy Co
Sec. 2, 10N, 8W
Grady Co, OK

Cement volumes will be adjusted depending on hole size

9a. Proposed Drilling Plan:

Pilot Hole TD No Pilot KOP 11,387' EOC 12,672'
Hole'

Set Surface and Intermediate casing strings Drill production hole to KOP Continue drilling lateral through the curve to TD Run prod casing & cement

10. Pressure Control Equipment:

Exhibit "E-1" A BOP consisting of three rams, including one blind rams and two pipe rams, and one annular preventer Below the surface casing, a 5M system will be used. Below the intermediate casing, a 10M system will be used See attachments for BOP and choke manifold diagrams An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack A Rotating head may be installed as needed A kelly cock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor

BOP and associated equipment will be installed, used, maintained, and tested in a manner necessary to assure well control and shall be in place and operational prior to drilling the surface casing shoe The Annular Preventer shall be functioned at least weekly. The pipe and blind rams will be operated each trip No abnormal pressure or temperature is expected while drilling

BOPS will be tested by an independent service company The ram preventers, choke manifold, and safety valves will be tested as follows On the surface casing, pressure tests will be made to 250 psi low and 5000 psi high On the intermediate casing, pressure tests will be made to 250 psi low and 10000 psi high

The Annular Preventer will be tested to 250 psi low and 2500 psi high on the surface casing, and 250 low and 3500 high on the intermediate casing

Cimarex Energy Co requests a variance to drill this well using a co-flex line between the BOP and choke manifold Certification for proposed co-flex hose is attached (please see Exhibit F, F-1, F-2, F-3) The hose is not required by the manufacturer to be anchored In the event the specific hose is not available, one of equal or higher rating will be used Variance to include Hammer Union connections on lines downstream of the buffer tank only

11. Proposed Mud Circulating System:

Depth	Mud Weight	Visc	Fluid Loss	Type Mud
0' to 1500'	7.90 - 8.40	28	NC	FW Spud Mud
1500' to 10654'	8.70 - 9.20	30-32	NC	FW/Gel
10654' to 22072'	13.00 - 13.50	30-32	NC	OBM

Operator reserves the right drill with WBM to KOP depending on the possibility of having a Morrow/Springer formation depleted from offset production to reduce risk associated with the loss of OBM After getting to KOP, the WBM would be displaced to OBM

Sufficient mud materials will be kept on location at all times in order to combat lost circulation or unexpected kicks In order to run DSTs, open hole logs, and casing, the viscosity and water loss may have to be adjusted in order to meet these needs

The Mud Monitoring System is an electronic Pason System satisfying requirements of Onshore Order 1

12. Testing, Logging and Coring Program:

- A Mud logging program 2 man unit from 6000 to TD
- B Electric logging program GR -- KOP to TD
- C No DSTs or cores are planned at this time
- D CBL w/ CCL from as far as gravity will let it fall to TOC

13. Potential Hazards:

No abnormal pressures or temperatures are expected

Estimated BHP 8390 psi

Estimated BHT 214°

No wellbore lies within 300 ft center-to-center measured from the proposed well at any depth Anti-collision report is not required on the proposed well

Over-pressured zones are possible from the Oswego through the Mississippi Lime (Meramec and Osage Groups) The Morrow and

Application to Drill
Hines Federal 1H-0235X
Cimarex Energy Co.
Sec. 2, 10N, 8W
Grady Co., OK

Springer sandstones are absent here.

Lost Circulation Zones of Permian Evaporates (Blaine Anhydrite through the Wellington Evaporates are intermittent from 230-feet-of-depth through 3,300-feet-of-depth). Lost Circulation is can also occur in the Cottage Grove interval in the area.

Sufficient barite material will be available if pressure is encountered. Cimarex also has contingency liner and liner hanger on stand-by if needed to cover up encountered pressure that is deemed too risky to move forward with the drilling of the well.

Sufficient LCM material will be on location if lost circulation is encountered. Additional drilling fluid will be stored on location at all times in addition to the drilling rig pit system. Drilling fluid can be mixed on location or mixed in vendor mud plant and trucked to location if needed.

14. Construction and Drilling:

Road and location construction will begin after BLM approval of APD. Anticipated spud date as soon as approved.

Drilling expected to take: 35 days.

If production casing is run an additional 30 days will be required to complete and construct surface facilities.

15. Other Facets of Operations:

If production casing is run an additional 30 days will be required to complete and construct surface facilities.

Woodford pay will be perforated and stimulated.

The proposed well will be tested and potentialized as **Gas**

16. Completion

Hydraulic fracturing will occur through the production casing. The burst design calculation assumes TOC at design, therefore, the backside of the production casing is not evacuated with OBM left in the annulus. The maximum pumping pressure is 11,300 psi with a maximum proppant fluid weight of 9.5 ppg. The design safety factor for burst is 1.125.

The surface frac stack (valves, manifold, lines, etc.) will be rated at least to 15M psi (unless the stack is isolated by a WIT), and, along with the 5.5" frac string, must be tested to at least the maximum treating pressure.

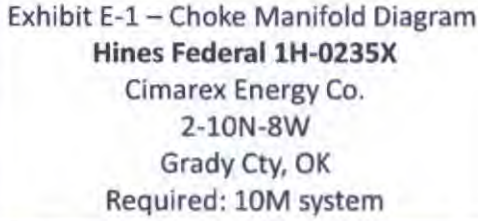
Upon request, operator will provide proof of cement bonding by bond log. Operator is responsible for log interpretations and certification prior to frac treatment.

Upon request, operator will provide estimated fracture length, flowback storage, volumes of fluids and amount of sand to be used, and number of stages of frac procedure. Furthermore, a report of the annulus pressures before and after each stage of treatment may be requested by BLM. The report may include chemical additives (other than proprietary), dissolved solids in frac fluid, and depth of perforations.

17. Plug and Abandon Cost

Restoration Cost: \$40,000.00 Wellbore Cost: \$125,000.00

Total Cost: \$165,000.00



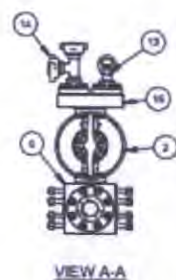
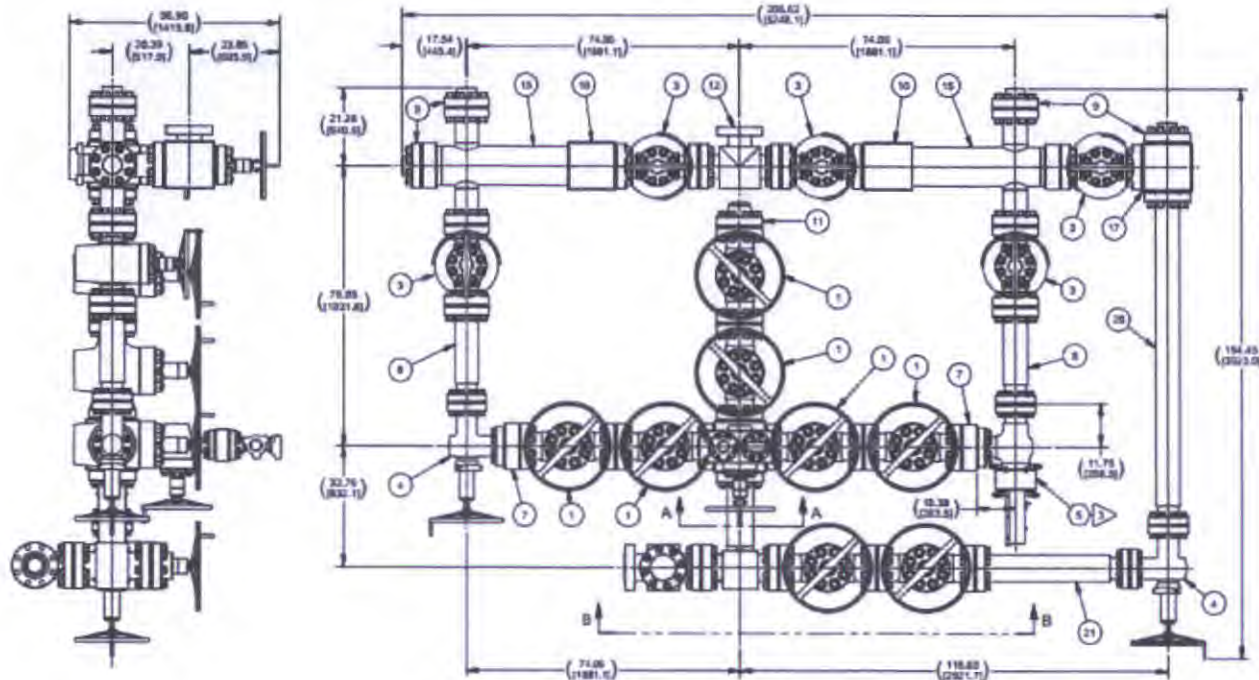
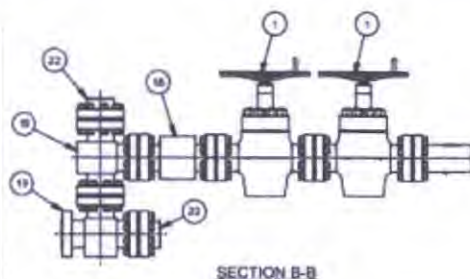


Exhibit E-1 – Choke
Manifold Diagram
Hines Federal 1H-
0235X
Cimarex Energy Co.
2-10N-8W
Grady Cty, OK
Required: 10M system

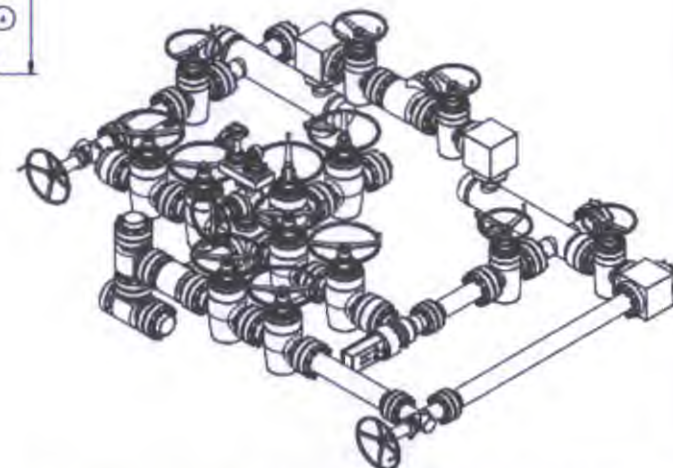


SECTION B-B

CUSTOMER REVIEW/APPROVAL

<input type="checkbox"/> CM	Correct As Noted. Submit revised document.
<input type="checkbox"/> NF	Not for Fabrication. Do not start fabricating equipment represented until change is corrected. Correct and resubmit design.
<input type="checkbox"/> PD	Final Design Document. Design document is accurate.
REVIEWED BY:	DATE:

PARTS LIST	
ITEM	DESCRIPTION
1	1 RATE VALVE, MANUAL, 4.00" 10M FLANGED CONNECTIONS
2	1 RATE VALVE, MANUAL, 2.00" 10M FLANGED CONNECTIONS
3	5 RATE VALVE, MANUAL, 4.00" 8M FLANGED CONNECTIONS
4	2 ADJUSTABLE CHOKE, 3.00" 10M FLANGED INLET & OUTLET
5	1 DRILLING CHOKE, ACTUATED, 3.00" 10M FLANGED INLET & OUTLET
6	1 CROSS, 5 WAY, 4.00" 10M THRU X 4.00" 10M THRU X 2.00" 10M
7	1 CROSS, 5 WAY, 4.00" 10M THRU X 4.00" 10M THRU X 2.00" 10M
8	1 ADAPTER SPOCK, 4.00" 8M X 3.00" 10M FLANGED CONNECTIONS, 20" LG
9	4 FLANGE, W/ RECESSED BUFFER CAVITY, 4.00" 8M
10	2 CONNECTING BLOCK, 4.00" 8M X 4.00" 8M 90 DEG
11	1 WELDING FLANGE, 2.00" 10M X 8" EYE
12	1 TEE, FLANGED, 4.00" 10M THRU X 4.00" 8M
13	1 PRESSURE GAUGE, 0-15,000 PSI W/ 2.00" 10M FLANGE
14	1 BERRY INSTRUMENT TEE WITH 2.00" 10M FLG INLET & (2) 1/2" NPT FEMALE OUTLETS
15	2 BUFFER TANK, 10.5" ID X 6.25" D A "SA SLO", W/ (3) 4.00" 8M FLANGED SIDE OUTLETS, (1) 2" 1000 MALE UNION SIDE OUTLET, (1) 4.00" 8M STUDDED END, (1) 10.75" OD BLIND END CAP
16	1 PRESSURE BLOCK, W/ (2) 2.00" 10M TYP AND (1) 2.00" 10M BOTTOM CONNECTIONS
17	1 TEE, 4.00" 8M THRU X 4.00" 8M
18	1 WELDMENT, TEE, 4-1/2" 10M
19	2 TEE, FLANGED, 4.00" 10M THRU X 4.00" 10M
20	1 ADAPTER SPOCK, 4.00" 8M X 3.00" 10M FLANGED CONNECTIONS, 9E 10" LG
21	1 SPACER SPOCK, 4.00" 10M X 3.00" 10M FLANGED CONNECTIONS, 41 50" LG
22	2 FLANGE, W/ RECESSED BUFFER CAVITY, 4.00" 10M
23	2 STUD, AT, 1.5" UNF-2A, 6.75" LG
24	2 STUD, AT, 1.5" UNF-2A, 8" LG
25	2 STUD, AT, 1.5" UNF-2A, 8" LG
26	2 NUT, HEAVY HEX, 1.5" UNF-2A
27	2 NUT, HEAVY HEX, 1.5" UNF-2A
28	2 NUT, HEAVY HEX, 1.5" UNF-2A
29	17 RING GASKET, RS-39
30	4 RING GASKET, RS-152
31	5 RING GASKET, SA-154
32	8 RING GASKET, SA-152



NOTES:

1. STUDS, NUTS, RING GASKETS AND NAME PLATE ARE NOT REFERENCED ON DRAWING.
2. BOLT HOLES STRADDLE COMMON CENTERLINE.

CUSTOMER SUPPLIED: 1-1/2" 10M HYD CHOKE; MUST FIT THESE DIMENSIONS.

		DO NOT SCALE 1" = 10'-0"	CAMERON SYSTEMS 10000 14-34-35-03
CAMERON SYSTEMS 10000 14-34-35-03		1" = 10'-0"	

Hole Sections Utilized

- 12-1/4" hole below Surface Casing
- 8-3/4" Hole below Intermediate Casing

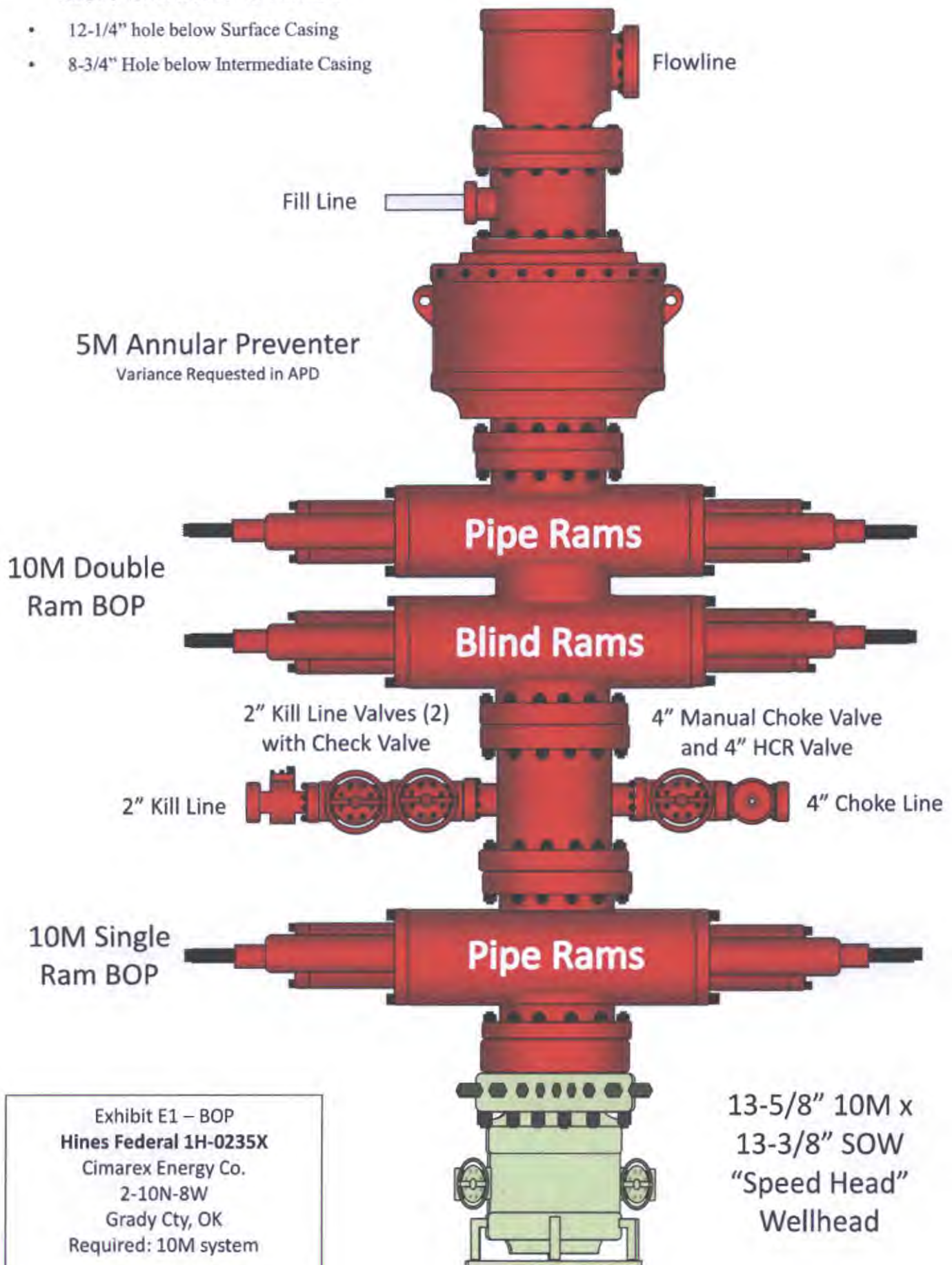


Exhibit E1 – BOP
Hines Federal 1H-0235X
Cimarex Energy Co.
2-10N-8W
Grady Cty, OK
Required: 10M system

Casing Assumptions Worksheet

Hines Federal 1H-0235X

Cimarex Energy Co.

2-10N-8W

Grady Cty, OK

										Capacity	
Size, in	Weight, #/ft	Grade	Thread	I.D., in	Drift I.D., in	Cplg O.D., in	Burst, psi	Collapse, psi	Tension, lbs	Bbls/ft	cu. ft./ft.
13 3/8	54.5	J55	STC	12.615	12.459	14.375	2,730	1,130	514,000	0.1546	0.8680
9 5/8	40.0	L80	LTC	8.835	8.750	10.625	5,750	3,090	737,000	0.0758	0.4257
5 1/2	20.0	P110	LTC	4.778	4.653	6.050	12,630	11,080	548,000	0.0222	0.1245
5 1/2	20.0	P110	BTC	4.778	4.653	6.050	12,360	11,080	641,000	0.0222	0.1245



Planned Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Company	Slot	Hines Federal 1H 0235X
Area	Oklahoma	Well	Subject
Field	Grady County, OK (Cimarex Energy Company) NAD27 / Grid	Wellbore	Hines Federal 1H 0235X Planned
Facility	Hines Federal 1H 0235X Section 2 10N 8W		

REPORT SETUP INFORMATION

Projection System	NAD27 / Lambert Oklahoma SP, Southern Zone (3502), US feet	Software System	WellArchitect® 5.0
North Reference	Grid	User	Ferrmikj
Scale	1.000028	Report Generated	03/Nov/2016 at 3:35:29 PM
Convergence at slot	0.01° West	Database/Source file	OKC/C:\Users\Ferrmikj\AppData\Roaming\Well Explorer\temp\Cimarex Hines Federal 1H 0235X (Plan 2).xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	0.00	0.00	1995317.00	738996.00	35°21'50.213"N	98°00'56.538"W
Facility Reference Pt			1995317.00	738996.00	35°21'50.213"N	98°00'56.538"W
Field Reference Pt			609601.22	0.00	33°14'50.100"N	102°32'53.015"W

WELLPATH DATUM

Calculation method	Minimum curvature	Rig on Hines Federal 1H 0235X (RKB) to Facility Vertical Datum	25.00ft
Horizontal Reference Pt	Slot	Rig on Hines Federal 1H 0235X (RKB) to Mean Sea Level	1302.00ft
Vertical Reference Pt	Rig on Hines Federal 1H 0235X (RKB)	Rig on Hines Federal 1H 0235X (RKB) to Mud Line at Slot (Hines Federal 1H 0235X)	25.00ft
MD Reference Pt	Rig on Hines Federal 1H 0235X (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	4.15°



Planned Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Company	Slot	Hines Federal 1H 0235X
Area	Oklahoma	Well	Subject
Field	Grady County, OK (Cimarex Energy Company) NAD27 / Grid	Wellbore	Hines Federal 1H 0235X Planned
Facility	Hines Federal 1H 0235X Section 2 10N 8W		

WELLPATH DATA (116 stations) † = Interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
0.00†	0.000	79.141	0.00	0.00	0.00	0.00	0.00	
25.00	0.000	79.141	25.00	0.00	0.00	0.00	0.00	SL
11386.50	0.000	79.141	11386.50	0.00	0.00	0.00	0.00	KOP
11400.00†	1.620	79.141	11400.00	0.05	0.04	0.19	12.00	
11500.00†	13.617	79.141	11498.93	3.48	2.53	13.18	12.00	
11600.00†	25.614	79.141	11592.96	12.16	8.84	46.09	12.00	
11700.00†	37.611	79.141	11677.97	25.71	18.70	97.48	12.00	
11800.00†	49.608	79.141	11750.24	43.54	31.67	165.09	12.00	
11900.00†	61.605	79.141	11806.62	64.88	47.18	245.98	12.00	
12000.00†	73.602	79.141	11844.68	88.79	64.57	336.62	12.00	
12009.15	74.699	79.141	11847.15	91.06	66.23	345.26	12.00	EOB/EOT
12100.00†	75.528	67.892	11870.56	121.97	91.11	429.30	12.00	
12189.58†	76.863	56.906	11892.00	167.70	131.37	506.25	12.00	WDFD Top 11892' TVD (Lat: 35.36430836 N Long: 98.01400888 W)
12200.00†	77.050	55.638	11894.35	173.93	137.00	514.69	12.00	
12300.00†	79.134	43.558	11915.06	242.47	200.32	589.02	12.00	
12400.00†	81.681	31.664	11931.78	324.59	278.30	649.05	12.00	
12500.00†	84.575	19.932	11943.79	416.70	367.53	692.15	12.00	
12600.00†	87.693	8.316	11950.55	514.79	464.11	716.43	12.00	
12671.90†	90.000	0.000	11952.00	586.61	535.74	721.64	12.00	Land Point 12671.90' MD (11952' TVD) X:1996038.65 Y:739531.76 Lat:35.36542024 N Long: 98.01328512 W
12671.90	90.000	0.000	11952.00	586.61	535.74	721.64	12.00	LP 11952' TVD
12700.00†	90.000	0.000	11952.00	614.64	563.84	721.64	0.00	
12800.00†	90.000	0.000	11952.00	714.37	663.84	721.64	0.00	
12900.00†	90.000	0.000	11952.00	814.11	763.84	721.64	0.00	
13000.00†	90.000	0.000	11952.00	913.85	863.84	721.64	0.00	
13100.00†	90.000	0.000	11952.00	1013.58	963.84	721.64	0.00	
13200.00†	90.000	0.000	11952.00	1113.32	1063.84	721.64	0.00	
13300.00†	90.000	0.000	11952.00	1213.06	1163.84	721.64	0.00	
13400.00†	90.000	0.000	11952.00	1312.80	1263.84	721.64	0.00	
13500.00†	90.000	0.000	11952.00	1412.53	1363.84	721.64	0.00	
13600.00†	90.000	0.000	11952.00	1512.27	1463.84	721.64	0.00	
13700.00†	90.000	0.000	11952.00	1612.01	1563.84	721.64	0.00	
13800.00†	90.000	0.000	11952.00	1711.75	1663.84	721.64	0.00	
13900.00†	90.000	0.000	11952.00	1811.48	1763.84	721.64	0.00	
14000.00†	90.000	0.000	11952.00	1911.22	1863.84	721.64	0.00	
14100.00†	90.000	0.000	11952.00	2010.96	1963.84	721.64	0.00	
14200.00†	90.000	0.000	11952.00	2110.69	2063.84	721.64	0.00	
14300.00†	90.000	0.000	11952.00	2210.43	2163.84	721.64	0.00	
14400.00†	90.000	0.000	11952.00	2310.17	2263.84	721.64	0.00	
14500.00†	90.000	0.000	11952.00	2409.91	2363.84	721.64	0.00	
14600.00†	90.000	0.000	11952.00	2509.64	2463.84	721.64	0.00	
14700.00†	90.000	0.000	11952.00	2609.38	2563.84	721.64	0.00	BIA #1 14700.0' MD (11952.0' TVD) 2263' FNL, 1674' FEL 35.370921 -98.013273
14800.00†	90.000	0.000	11952.00	2709.12	2663.84	721.64	0.00	
14900.00†	90.000	0.000	11952.00	2808.86	2763.84	721.64	0.00	
15000.00†	90.000	0.000	11952.00	2908.59	2863.84	721.64	0.00	
15100.00†	90.000	0.000	11952.00	3008.33	2963.84	721.64	0.00	



Planned Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Company	Slot	Hines Federal 1H 0235X
Area	Oklahoma	Well	Subject
Field	Grady County, OK (Cimarex Energy Company) NAD27 / Grid	Wellbore	Hines Federal 1H 0235X Planned
Facility	Hines Federal 1H 0235X Section 2 10N 8W		

WELLPATH DATA (116 stations) † = Interpolated/extrapolated station

MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	DLS (°/100ft)	Comments
15200.00†	90.000	0.000	11952.00	3108.07	3063.84	721.64	0.00	
15300.00†	90.000	0.000	11952.00	3207.80	3163.84	721.64	0.00	
15400.00†	90.000	0.000	11952.00	3307.54	3263.84	721.64	0.00	
15500.00†	90.000	0.000	11952.00	3407.28	3363.84	721.64	0.00	
15600.00†	90.000	0.000	11952.00	3507.02	3463.84	721.64	0.00	
15700.00†	90.000	0.000	11952.00	3606.76	3563.84	721.64	0.00	
15800.00†	90.000	0.000	11952.00	3706.49	3663.84	721.64	0.00	
15900.00†	90.000	0.000	11952.00	3806.23	3763.84	721.64	0.00	
16000.00†	90.000	0.000	11952.00	3905.97	3863.84	721.64	0.00	BIA#2 16000.0' MD (11952.0' TVD) 958' FNL, 1671' FEL 35.374521 -98.01325
16100.00†	90.000	0.000	11952.00	4005.70	3963.84	721.64	0.00	
16200.00†	90.000	0.000	11952.00	4105.44	4063.84	721.64	0.00	
16300.00†	90.000	0.000	11952.00	4205.18	4163.84	721.64	0.00	
16400.00†	90.000	0.000	11952.00	4304.91	4263.84	721.64	0.00	
16500.00†	90.000	0.000	11952.00	4404.65	4363.84	721.64	0.00	
16600.00†	90.000	0.000	11952.00	4504.39	4463.84	721.64	0.00	
16700.00†	90.000	0.000	11952.00	4604.13	4563.84	721.64	0.00	
16800.00†	90.000	0.000	11952.00	4703.86	4663.84	721.64	0.00	
16900.00†	90.000	0.000	11952.00	4803.60	4763.84	721.64	0.00	
17000.00†	90.000	0.000	11952.00	4903.34	4863.84	721.64	0.00	
17100.00†	90.000	0.000	11952.00	5003.08	4963.84	721.64	0.00	
17200.00†	90.000	0.000	11952.00	5102.81	5063.84	721.64	0.00	
17300.00†	90.000	0.000	11952.00	5202.55	5163.84	721.64	0.00	
17400.00†	90.000	0.000	11952.00	5302.29	5263.84	721.64	0.00	
17500.00†	90.000	0.000	11952.00	5402.02	5363.84	721.64	0.00	
17600.00†	90.000	0.000	11952.00	5501.76	5463.84	721.64	0.00	
17700.00†	90.000	0.000	11952.00	5601.50	5563.84	721.64	0.00	
17800.00†	90.000	0.000	11952.00	5701.24	5663.84	721.64	0.00	
17900.00†	90.000	0.000	11952.00	5800.97	5763.84	721.64	0.00	
18000.00†	90.000	0.000	11952.00	5900.71	5863.84	721.64	0.00	
18100.00†	90.000	0.000	11952.00	6000.45	5963.84	721.64	0.00	
18200.00†	90.000	0.000	11952.00	6100.19	6063.84	721.64	0.00	
18300.00†	90.000	0.000	11952.00	6199.92	6163.84	721.64	0.00	
18400.00†	90.000	0.000	11952.00	6299.66	6263.84	721.64	0.00	
18500.00†	90.000	0.000	11952.00	6399.40	6363.84	721.64	0.00	
18600.00†	90.000	0.000	11952.00	6499.13	6463.84	721.64	0.00	
18700.00†	90.000	0.000	11952.00	6598.87	6563.84	721.64	0.00	
18800.00†	90.000	0.000	11952.00	6698.61	6663.84	721.64	0.00	
18900.00†	90.000	0.000	11952.00	6798.35	6763.84	721.64	0.00	
19000.00†	90.000	0.000	11952.00	6898.08	6863.84	721.64	0.00	
19100.00†	90.000	0.000	11952.00	6997.82	6963.84	721.64	0.00	
19200.00†	90.000	0.000	11952.00	7097.56	7063.84	721.64	0.00	
19300.00†	90.000	0.000	11952.00	7197.30	7163.84	721.64	0.00	
19400.00†	90.000	0.000	11952.00	7297.03	7263.84	721.64	0.00	
19500.00†	90.000	0.000	11952.00	7396.77	7363.84	721.64	0.00	
19600.00†	90.000	0.000	11952.00	7496.51	7463.84	721.64	0.00	



Planned Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Company	Slot	Hines Federal 1H 0235X
Area	Oklahoma	Well	Subject
Field	Grady County, OK (Cimarex Energy Company) NAD27 / Grid	Wellbore	Hines Federal 1H 0235X Planned
Facility	Hines Federal 1H 0235X Section 2 10N 8W		

WELLPATH DATA (116 stations) † = Interpolated/extrapolated station									
MD (ft)	Inclination [°]	Azimuth [°]	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	DLS [°/100ft]	Comments	
19700.00†	90.000	0.000	11952.00	7596.24	7563.84	721.64	0.00		
19800.00†	90.000	0.000	11952.00	7695.98	7663.84	721.64	0.00		
19900.00†	90.000	0.000	11952.00	7795.72	7763.84	721.64	0.00		
20000.00†	90.000	0.000	11952.00	7895.46	7863.84	721.64	0.00		
20100.00†	90.000	0.000	11952.00	7995.19	7963.84	721.64	0.00		
20200.00†	90.000	0.000	11952.00	8094.93	8063.84	721.64	0.00		
20300.00†	90.000	0.000	11952.00	8194.67	8163.84	721.64	0.00		
20400.00†	90.000	0.000	11952.00	8294.41	8263.84	721.64	0.00		
20500.00†	90.000	0.000	11952.00	8394.14	8363.84	721.64	0.00		
20600.00†	90.000	0.000	11952.00	8493.88	8463.84	721.64	0.00		
20700.00†	90.000	0.000	11952.00	8593.62	8563.84	721.64	0.00		
20800.00†	90.000	0.000	11952.00	8693.35	8663.84	721.64	0.00		
20900.00†	90.000	0.000	11952.00	8793.09	8763.84	721.64	0.00		
21000.00†	90.000	0.000	11952.00	8892.83	8863.84	721.64	0.00		
21100.00†	90.000	0.000	11952.00	8992.57	8963.84	721.64	0.00		
21200.00†	90.000	0.000	11952.00	9092.30	9063.84	721.64	0.00		
21300.00†	90.000	0.000	11952.00	9192.04	9163.84	721.64	0.00		
21400.00†	90.000	0.000	11952.00	9291.78	9263.84	721.64	0.00		
21500.00†	90.000	0.000	11952.00	9391.52	9363.84	721.64	0.00		
21600.00†	90.000	0.000	11952.00	9491.25	9463.84	721.64	0.00		
21700.00†	90.000	0.000	11952.00	9590.99	9563.84	721.64	0.00		
21800.00†	90.000	0.000	11952.00	9690.73	9663.84	721.64	0.00		
21900.00†	90.000	0.000	11952.00	9790.47	9763.84	721.64	0.00		
22000.00†	90.000	0.000	11952.00	9890.20	9863.84	721.64	0.00		
22071.90†	90.000	0.000	11952.00	9961.91	9935.74	721.64	0.00	PBHL 22071.90' MD (11952' TVD) X: 1996038.65 Y: 748832.01 Lat: 35.39124493 N Long: 98.01328927 W	
22071.90	90.000	0.000	11952.00	9961.92	9935.74	721.64	0.00	BHL 165' FNL 1680' FEL	

Cimarex Energy Company

Hines Federal 1H 0235X (Plan 2)

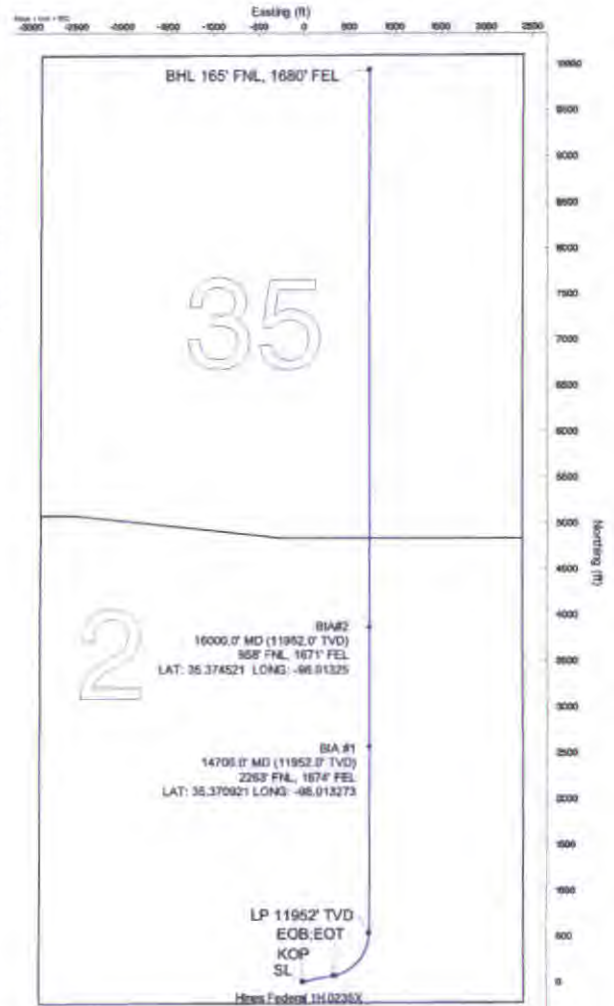
Hines Federal 1H 0235X

Grady County, OK (Cimarex Energy Company) NAD27 / Grid

True vertical depths are referenced to Rig on Hines Federal 1H 0235X (R93)				* * Wellbore was transformed from a different geographic datum	
Measured depths are referenced to Rig on Hines Federal 1H 0235X (R93)				North Reference: Grid north	
Rig on Hines Federal 1H 0235X (R93) to Mean Sea Level: 1352 feet				Scale: True distance	
Mean Sea Level to Mud line (At Stat. Hines Federal 1H 0235X) -1277 feet				Depth are in feet	
Conversion are in feet referenced to SLS				Created by: Forming on 2016-10-20	
Database: OKC					
Location Information					
Facility Name		Grid East (US E)	Grid North (US N)	Latitude	Longitude
Hines Federal 1H 0235X Section 2 186 RW		1995317.000	739996.200	35°21'50.213"N	98°07'58.538"W
State	Local E (ft)	Local N (ft)	Grid East (US E)	Grid North (US N)	Latitude
OK	0.00	0.00	1995317.000	739996.200	35°21'50.213"N
Hines Federal 1H 0235X					98°07'58.538"W
Rig on Hines Federal 1H 0235X (R93) to Mud line (At Stat. Hines Federal 1H 0235X)					264
Mean Sea Level to Mud line (At Stat. Hines Federal 1H 0235X)					-1277
Rig on Hines Federal 1H 0235X (R93) to Mean Sea Level					1352



WGS84 (1984) to NAD83 (1983) Dec 22 11" False NORTH +1
Magnetic North is 4.28 degrees East of True North (at 01/01/2016)
Grid North is 0.24 degrees West of True North
To convert azimuth from magnetic to Grid add 4.28 degrees



Well Profile Data

Design Comment	MD (ft)	Inc (")	Az (")	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
SL	25.00	0.000	79.141	25.00	0.00	0.00	0.00	0.00
KOP	11386.50	0.000	79.141	11386.50	0.00	0.00	0.00	0.00
EOB:EOT	12009.15	74.699	79.141	11847.15	66.23	345.26	12.00	91.06
LP 11952' TVD	12671.90	90.000	0.000	11952.00	535.74	721.64	12.00	586.61
BHL 165' FNL, 1680' FEL	22071.90	90.000	0.000	11952.00	9935.74	721.64	0.00	9961.92



PBHL
22071.90' MD (11952' TVD)
X: 1996038.65 Y: 748932.01
Lat: 35.39124493 N Long: 98.01328927 W



**Application to Drill
Hines Federal 1H-0235X**

Cimarex Energy Co.

Sec. 2, 10N, 8W

Grady Co., OK

In response to questions asked under Section II B of Bulletin NTL-6, the following information is provided for your consideration:

1. Location: SHL 235 FLS & 2410 FEL ; Sec. 2-10N-8W

BHL 165 FNL & 1680 FEL ; Sec. 35-11N-8W

2. Elevation Above Sea Level: 1,277' GR

3. Geologic Name of Surface Formation: Quaternary Alluvium Deposits

4. Drilling Tools and Associated Equipment: Conventional rotary drilling rig using fluid as a circulating medium for solids removal

5. Proposed Drilling Depth: 22,072 MD 11,952 TVD Pilot Hole TD: N/A

6. Estimated Tops of Geological Markers:

Formation	Est Top	Bearing
HEEBNER	6744	N/A
TONKAWA	7327	N/A
COTTAGE GROVE ZONE	8076	N/A
HOGSHOOTER	8369	N/A
CHECKERBOARD	8788	N/A
CHEROKEE	9858	N/A
VERDIGRIS	9967	N/A
PKLM	10231	N/A
RED FORK ZONE	10282	N/A
INOLA	10459	N/A
ATOKA	10472	N/A
NOVI	10609	N/A
MORROW SHALE	10634	N/A
CHESTER	10707	N/A
MERAMEC	11627	N/A
LOWER MERAMEC 1	11724	N/A
OSAGE	11886	N/A
WOODFORD /SH/	11892	N/A
WDFD_LANDING_ZONE	11952	N/A
HUNTON	12050	N/A

7. Possible Mineral Bearing Formation: Shown above

7A. OWRB Base of Treatable Water: 240'

Oklahoma Corporation Commission requires surface casing to be set between 50' and 250' below base of treatable water, Cimarex proposes to set the surface casing at 1500' and use 13-3/8" casing. An Oklahoma Corporation Commission casing exception will be obtained.

8. Casing Program:

Name	Casing Depth From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Open Hole Size (inches)	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	BHP (psig)	Anticipated Mud Weight (ppg)	Collapse SF at Full Evacuation(1.125)	Collapse SF at 1/3 Evacuation(1.125)	Burst SF (1.125)	Cumulative Air Weight	Cumulative Buoyed Weight (lbs)	Buoyant Tension SF (1.8)
Surface	0	1500	1500	17 1/2	13-3/8"	54.50	J-55	ST&C	New	655	8.4	1.72		4.18	81,750	71,266	7.21
Intermediate	0	10654	10654	12 1/4	9-5/8"	40.00	L-80	LT&C	New	5096	9.2		1.62	1.13	426,160	366,302	1.98
Production	0	11387	11387	8 3/4	5-1/2"	20.00	P-110	LT&C	New	7993	13.5	1.39		1.58	239,040	189,772	2.89
Production	11387	22072	11952	8 3/4	5-1/2"	20.00	P-110	BT&C	New	8390	13.5	1.32		1.47	11,300	8,971	71.45

Note: Operator may drill an 8-1/2" OH from end of curve to TD of the well. This is to reduce the need to ream the conventionally drilled curve to run a RSS assembly into the lateral.

Application to Drill
Hines Federal 1H-0235X
 Cimarex Energy Co.
 Sec. 2, 10N, 8W
 Grady Co., OK

8A. Casing Design and Casing Loading Assumptions:

Surface	Tension	A 1.8 design factor with effects of buoyancy: 8.40 ppg.
	Collapse	A 1.125 design factor with full internal evacuation and a collapse force equal to a 8.40 ppg mud gradient.
	Burst	A 1.125 design factor with a surface pressure equal to the anticipated BHP at setting depth. No backup or gas gradient assumed.
Intermediate	Tension	A 1.8 design factor with effects of buoyancy: 9.20 ppg.
	Collapse	A 1.125 design factor evacuated 1/3 TVD of next casing string with a collapse force equal to a 9.20 ppg mud gradient. During the running of the casing, the operator will stop and fill the casing as need to ensure it does not collapse.
	Burst	A 1.125 design factor with a surface pressure equal to the anticipated BHP at setting depth. No backup or gas gradient assumed.
Production and/or Production Completion System	Tension	A 1.8 design factor with effects of buoyancy: 13.50 ppg.
	Collapse	A 1.125 design factor with full internal evacuation of next casing string with a collapse force equal to a 13.50 ppg mud gradient.
	Burst	A 1.125 design factor with a surface pressure equal to the anticipated BHP at setting depth. No backup or gas gradient assumed.

Operator requests a variance on conditions during testing of the intermediate and production casing to reflect an annulus back up to stay under the 70% Burst consideration. Back up will not exceed 0.432 psi/ft (8.32 ppg).

Example: Maximum MW for the production is 13.5 ppg. To perform an FIT with a 9.4 ppg mud in the hole, 2,274 psi is needed (10,664' TVD). This exceeds the 70% of burst pressure at 10,654' TVD by 3,454 psi. In this case, a variance of 0324 psi/ft backup would be needed to meet the 70% of burst criterion. The actual variance would vary depending on actual wellbore conditions but will not exceed 0.432 psi/ft as mentioned above.

No FIT on the intermediate hole section since equivalent surface pressures required will be 100 psi or less. Perform FIT after drilling out of intermediate casing to max anticipated MW (~13.5ppg in this area).

Estimated fracture Gradient at surface shoe is 12 ppg. Estimated fracture Gradient at intermediate shoe is 15 ppg

										Capacity	
Size, in	Weight, #/ft	Grade	Thread	I.D., in	Drift I.D. in	Cplg O.D., in	Burst, psi	Collapse, psi	Tension, lbs	Bbls/ft	cu. ft./ft/
13 3/8	54.5	J55	STC	12.615	12.459	14.375	2,730	1,130	514,000	0.1546	0.8680
9 5/8	40.0	L80	LTC	8.835	8.750	10.625	5,750	3,090	737,000	0.0758	0.4257
5 1/2	20.0	P110	LTC	4.778	4.653	6.050	12,630	11,080	548,000	0.0222	0.1245
5 1/2	20.0	P110	BTC	4.778	4.653	6.050	12,360	11,080	641,000	0.0222	0.1245

9. Cementing Program:

Casing Type	Type	Sacks	Yield	Weight	Cubic Feet	Cement Blend
Surface	Lead	622	2.01	12.80		1250 Class A + 2% CaCl + LCM, 10.350 gps water
	Tail	195	1.34	14.80		260 Class C + LCM, 6.320 gps water
	TOC: 0		45% Excess			Centralizers per Onshore Order 2.III.B.1f
Intermediate	Lead	354	2.40	11.90		848 35:65 (poz/H) + Salt + Sodium Metasilicate + Bentonite + Fluid Loss + Dispersant + LCM + Retarder, 13.800 gps water
	Tail	165	1.07	16.40		176 Class H + Fluid Loss + Retarder, 4.420 gps water
	TOC: 8400		46% Excess			
Production	Tail	2587	1.34	14.80		3466 Class C + LCM, 6.320 gps water
	TOC: 9600		20% Excess			No centralizers planned in the lateral section. Every other joint from EOC to KOP. 1 every 4th joint from KOP to 500' inside previous casing.

Application to Drill
Hines Federal 1H-0235X

Cimarex Energy Co.
Sec. 2, 10N, 8W
Grady Co., OK

Cement volumes will be adjusted depending on hole size

9a. Proposed Drilling Plan:

Pilot Hole TD: No Pilot
Hole'

KOP: 11,387'

EOC: 12,672'

Set Surface and Intermediate casing strings. Drill production hole to KOP. Continue drilling lateral through the curve to TD. Run prod casing & cement.

10. Pressure Control Equipment:

Exhibit "E-1". A BOP consisting of three rams, including one blind rams and two pipe rams, and one annular preventer. Below the surface casing, a 5M system will be used. Below the intermediate casing, a 10M system will be used. Due to unavailability of a 10M annular preventer, a 5M annular preventer will be installed on all casing strings. See attachments for BOP and choke manifold diagrams. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A Rotating head may be installed as needed. A kelly cock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

BOP and associated equipment will be installed, used, maintained, and tested in a manner necessary to assure well control and shall be in place and operational prior to drilling the surface casing shoe. The Annular Preventer shall be functioned at least weekly. The pipe and blind rams will be operated each trip. No abnormal pressure or temperature is expected while drilling.

BOPS will be tested by an independent service company. The ram preventers, choke manifold, and safety valves will be tested as follows: On the surface casing, pressure tests will be made to 250 psi low and 5000 psi high. On the intermediate casing, pressure tests will be made to 250 psi low and 10000 psi high.

The Annular Preventer will be tested to 250 psi low and 2500 psi high on the surface casing, and 250 low and 3500 high on the intermediate casing.

Cimarex Energy Co. requests a variance to drill this well using a co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached (please see Exhibit F, F-1, F-2, F-3). The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.

11. Proposed Mud Circulating System:

Depth	Mud Weight	Visc	Fluid Loss	Type Mud
0' to 1500'	7.90 - 8.40	28	NC	FW Spud Mud
1500' to 10654'	8.70 - 9.20	30-32	NC	FW/Gel
10654' to 22072'	13.00 - 13.50	30-32	NC	OBM

Operator reserves the right drill with WBM to KOP depending on the possibility of having a Morrow/Springer formation depleted from offset production to reduce risk associated with the loss of OBM. After getting to KOP, the WBM would be displaced to OBM.

Sufficient mud materials will be kept on location at all times in order to combat lost circulation or unexpected kicks. In order to run DSTs, open hole logs, and casing, the viscosity and water loss may have to be adjusted in order to meet these needs.

The Mud Monitoring System is an electronic Pason System satisfying requirements of Onshore Order 1.

12. Testing, Logging and Coring Program:

- A. Mud logging program: 2 man unit from 6000 to TD
- B. Electric logging program: GR -- KOP to TD
- C. No DSTs or cores are planned at this time
- D.CBL w/ CCL from as far as gravity will let it fall to TOC

13. Potential Hazards:

No abnormal pressures or temperatures are expected.

Estimated BHP: 8390 psi

Estimated BHT: 214°

No wellbore lies within 300 ft center-to-center measured from the proposed well at any depth. Anti-collision report is not required on the proposed well.

Over-pressured zones are possible from the Oswego through the Mississippi Lime (Meramec and Osage Groups). The Morrow and

Application to Drill
Hines Federal 1H-0235X
Cimarex Energy Co.
Sec. 2, 10N, 8W
Grady Co., OK

Springer sandstones are absent here.

Lost Circulation Zones of Permian Evaporates (Blaine Anhydrite through the Wellington Evaporates are intermittent from 230-feet-of-depth through 3,300-feet-of-depth). Lost Circulation is can also occur in the Cottage Grove interval in the area.

Sufficient barite material will be available if pressure is encountered. Cimarex also has contingency liner and liner hanger on stand-by if needed to cover up encountered pressure that is deemed too risky to move forward with the drilling of the well.

Sufficient LCM material will be on location if lost circulation is encountered. Additional drilling fluid will be stored on location at all times in addition to the drilling rig pit system. Drilling fluid can be mixed on location or mixed in vendor mud plant and trucked to location if needed.

14. Construction and Drilling:

Road and location construction will begin after BLM approval of APD. Anticipated spud date as soon as approved.

Drilling expected to take: 35 days.

If production casing is run an additional 30 days will be required to complete and construct surface facilities.

15. Other Facets of Operations:

If production casing is run an additional 30 days will be required to complete and construct surface facilities.

Woodford pay will be perforated and stimulated.

The proposed well will be tested and potentialized as **Gas**

16. Completion

Hydraulic fracturing will occur through the production casing. The burst design calculation assumes TOC at design, therefore, the backside of the production casing is not evacuated with OBM left in the annulus. The maximum pumping pressure is 11,300 psi with a maximum proppant fluid weight of 9.5 ppg. The design safety factor for burst is 1.125.

The surface frac stack (valves, manifold, lines, etc.) will be rated at least to 15M psi (unless the stack is isolated by a WIT), and, along with the 5.5" frac string, must be tested to at least the maximum treating pressure.

Upon request, operator will provide proof of cement bonding by bond log. Operator is responsible for log interpretations and certification prior to frac treatment.

Upon request, operator will provide estimated fracture length, flowback storage, volumes of fluids and amount of sand to be used, and number of stages of frac procedure. Furthermore, a report of the annulus pressures before and after each stage of treatment may be requested by BLM. The report may include chemical additives (other than proprietary), dissolved solids in frac fluid, and depth of perforations.

17. Plug and Abandon Cost

Restoration Cost: \$40,000.00 Wellbore Cost: \$125,000.00

Total Cost: \$165,000.00

Exhibit F – Co-Flex Hose
Hines Federal 1H-0235X
Cimarex Energy Co.
2-10N-8W
Grady Cty, OK



Exhibit F-1 – Co-Flex Hose Hydrostatic Test

Hines Federal 1H-0235X

Cimarex Energy Co.



2-10N-8W

Grady Cty, OK



Midwest Hose
& Specialty, Inc.

INTERNAL HYDROSTATIC TEST REPORT

Customer: Oderco Inc		P.O. Number: odyd-271	
HOSE SPECIFICATIONS			
Type: Stainless Steel Armor Choke & Kill Hose		Hose Length: 45'ft.	
I.D. 4 INCHES		O.D. 9 INCHES	
WORKING PRESSURE 10,000 PSI	TEST PRESSURE 15,000 PSI		BURST PRESSURE 0 PSI
COUPLINGS			
Stem Part No. OKC OKC		Ferrule No. OKC OKC	
Type of Coupling: Swage-It			
PROCEDURE			
<i>Hose assembly pressure tested with water at ambient temperature.</i>			
TIME HELD AT TEST PRESSURE 15 MIN.		ACTUAL BURST PRESSURE: 0 PSI	
Hose Assembly Serial Number: 79793		Hose Serial Number: OKC	
Comments:			
Date: 3/8/2011	Tested: 		Approved: 



Midwest Hose
& Specialty, Inc.

Internal Hydrostatic Test Graph

Customer: Houston

Pick Ticket #: 94260

Hose Specifications

Hose Type

C.S.R.

I.D.

4"

Working Pressure

10000 PSI

Length

45'

O.D.

6.05"

Burst Pressure

Manufactured Safety Multiplier Applied

Verification

Type of Fitting

4 1/2" 10K

Die Size

6.38"

Hose Serial #

5544

Coupling Method

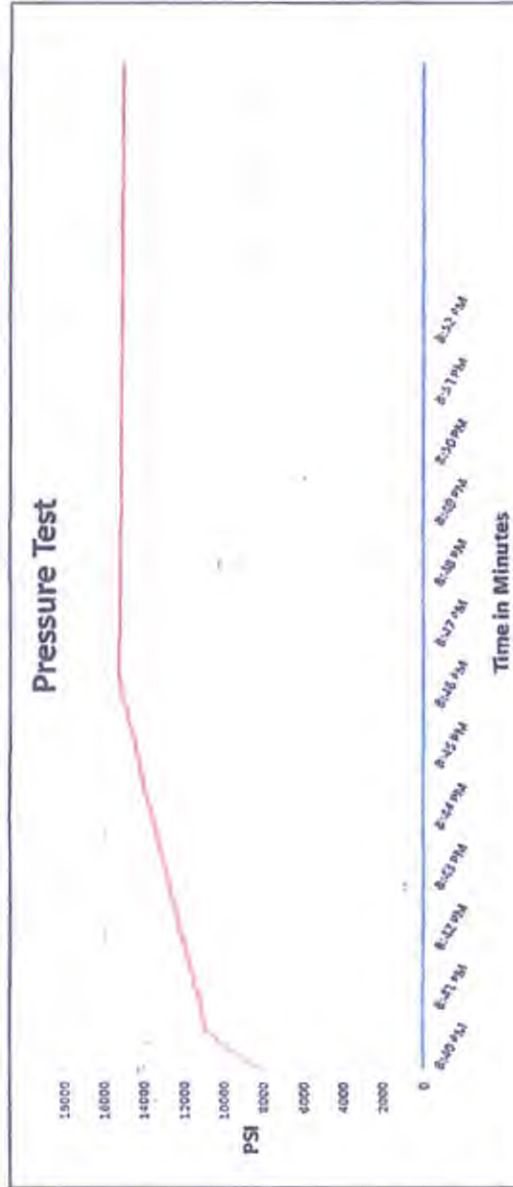
Swage

Final O.D.

6.25"

Hose Assembly Serial #

79793



Test Pressure 15000 PSI
Time Held at Test Pressure 11 Minutes
Actual Burst Pressure 15483 PSI
Peak Pressure 15483 PSI

Comments: Hose assembly pressure tested with water at ambient temperature.

Tested By: Zac McConnell

Approved By: Kim Thomez

[Signature]

[Signature]

March 3, 2011

Exhibit F-1 – Co-Flex Hose Hydrostatic Test
Hines Federal 1H-0235X
Cimarex Energy Co.
2-10N-8W
Grady Cty, OK

Exhibit F-2 - Co-Flex Hose
Hines Federal 1H-0235X
Cimarex Energy Co.
2-10N-8W
Grady Cty, OK



**Midwest Hose
& Specialty, Inc.**

Certificate of Conformity	
Customer:	PO
DEM	ODYD-271
SPECIFICATIONS	
Sales Order	Dated:
79793	3/8/2011
<p>We hereby certify that the material supplied for the referenced purchase order to be true according to the requirements of the purchase order and current industry standards</p> <p>Supplier: Midwest Hose & Specialty, Inc. 10640 Tanner Road Houston, Texas 77041</p>	
Comments:	
Approved:	Date:
<i>Samuel Hines</i>	3/8/2011



Exhibit F -3- Co-Flex Hose
Hines Federal 1H-0235X
Cimarex Energy Co.
2-10N-8W
Grady Cty, OK

Specification Sheet Choke & Kill Hose

The Midwest Hose & Specialty Choke & Kill hose is manufactured with only premium components. The reinforcement cables, inner liner and cover are made of the highest quality material to handle the tough drilling applications of today's industry. The end connections are available with API flanges, API male threads, hubs, hammer unions or other special fittings upon request. Hose assembly is manufactured to API 7K. This assembly is wrapped with fire resistant vermiculite coated fiberglass insulation, rated at 2000 degrees with stainless steel armor cover.

Working Pressure:	5,000 or 10,000 psi working pressure
Test Pressure:	10,000 or 15,000 psi test pressure
Reinforcement:	Multiple steel cables
Cover:	Stainless Steel Armor
Inner Tube:	Petroleum resistant, Abrasion resistant
End Fitting:	API flanges, API male threads, threaded or butt weld hammer unions, unbolt and other special connections
Maximum Length:	110 Feet
ID:	2-1/2", 3", 3-1/2", 4"
Operating Temperature:	-22 deg F to +180 deg F (-30 deg C to +82 deg C)

T 10 N - R 8 W

(INDIAN MERIDIAN)

PLAT SHOWING
PROPOSED LEASE ROAD IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA

Exhibit C-2

VICINITY MAP
SCALE: 1" = 1000'

S/4 CORNER
SECTION 2
PER C.C.R. BY
L.S. #1272
DATED 1/09/04

SW-SE
CIMAREX ENERGY CO.
Hines Federal 1H-0215X

PROPOSED LEASE RD.

REFERENCE BEARING
N 89°36'41" E

REFERENCE
STAKE
200' NORTH
ELEV. 1278'

SE CORNER
SECTION 2
PER C.C.R. BY
L.S. #1378
DATED 9/26/16



CIMAREX ENERGY CO.
Hines Federal 1H-0235X
235' FSL - 2410' FEL
Elev. 1277' Gr.
Elev. 1278' Gr. (NAVD88)

TOPSOIL AREA

PAD AREA

REFERENCE
STAKE
230' EAST
ELEV. 1277'

0+00.00 Begin Survey of Lease Road Route
at S. Edge of Pad (Elev. 1277.8')
0+02 R/W Fence (Elev. 1277.8')
0+10 & Ditch (Elev. 1274.0')
0+21 N. Edge of Road (Elev. 1279.5')
0+29 & Road (Elev. 1279.8')
0+35.08 End Survey of Lease Road Route
at E-W Section Line (Elev. 1279.8')

0+00.00 = (P.O.B.)
N 84°23'43" W - 380.03' FROM
THE S/4 CORNER OF SECTION 2

WATER WELL
LIVESTOCK TANK
ANCHOR

REFERENCE BEARING
N 89°36'41" E

S 00°18'28" E
35.08'

0+35.08 =
N 89°36'41" E - 378.41' FROM
THE S/4 CORNER OF SECTION 2

BASIS OF BEARING:
GEODETIC

BASIS OF ELEVATION:
1270' (NAVD 88)
AT THE SE CORNER OF
SECTION 2 PER OPUS
SOLUTION.

-NOTE-

The information shown herein is for
construction purposes ONLY.

This plat was prepared exclusively for

CIMAREX ENERGY CO.

SURVEYING AND MAPPING BY
TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA

6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847
Certificate of Authorization No. 1293 LS

SCALE: 1" = 100'

DATE: 10-11-16

INVOICE NO.: 266133

FILE: S2129A1.DWG

DWG. NO.: 103134-S2-129-A1

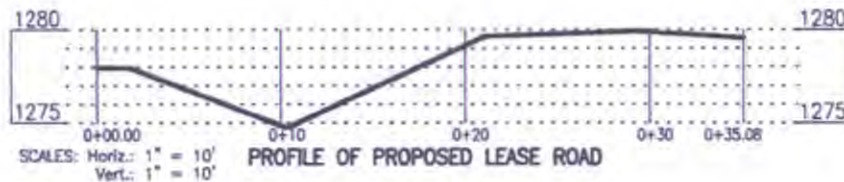
SHEET 1 OF 2

NO.	REVISION	DATE	BY
SURV. BY:	ES	10-10-16	
DRAWN BY:	RKM		
APPROVED BY:	TH		

T 10 N - R 8 W

(INDIAN MERIDIAN)

Exhibit C-2



CENTERLINE DESCRIPTION: (PROPOSED LEASE ROAD ROUTE IN THE SE/4 OF SECTION 2)

PROPOSED LEASE ROAD ROUTE LYING IN THE SOUTHEAST QUARTER (SE/4) OF SECTION 2, TOWNSHIP 10 NORTH, RANGE 8 WEST OF THE INDIAN MERIDIAN, GRADY COUNTY, OKLAHOMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING (P.O.B.) at a point on the south edge of a proposed pad, said point being North 84°23'43" East, a distance of 380.03 feet from the South Quarter (S/4) Corner of said Section 2;

THENCE South 00°18'28" East, a distance of 35.08 to and ending at a point on the South Line of said SE/4, said point being North 89°36'41" East, on said South Line, a distance of 378.41 feet from the South Quarter (S/4) Corner of said Section 2.

The Basis of Bearing for this description is Geodetic, North Zone, U.S. Feet

The Reference Bearing is the South Line of the SE/4 of said Section 2, Township 10 North, Range 8 West of the Indian Meridian, being North 89°36'41" East as shown on sheet 1 of 2, attached hereto and made a part thereof.

This description was prepared on October 13, 2016 by Thomas L. Howell, Licensed Professional Land Surveyor No. 1433.

SURVEYOR'S CERTIFICATE:

I, Thomas L. Howell, Oklahoma Licensed Professional Land Surveyor, No. 1433, do hereby certify that this plat of survey meets the Oklahoma Minimum Standards for the practice of land surveying as adopted by the Oklahoma State Board of Licensure for Professional Engineers and Land Surveyors.

Thomas L. Howell
Thomas L. Howell, P.L.S. No. 1433



				This plat was prepared exclusively for		SCALE: 1" = 100'
				CIMAREX ENERGY CO.		DATE: 10-11-16
NO.	REVISION	DATE	BY	and may not be relied upon by any other entity without the written consent of Topographic Land Surveyors of Oklahoma.		INVOICE NO.: 266133
SURV. BY: ES 10-10-16				SURVEYING AND MAPPING BY		FILE: S2129A1.DWG
DRAWN BY: RKM				TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA		DWG. NO.: 103134-S2-129-A1
APPROVED BY: TH				6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847		SHEET 2 OF 2
				Certificate of Authorization No. 1293 LS		

Exhibit A

Hines Federal 1H-0235X

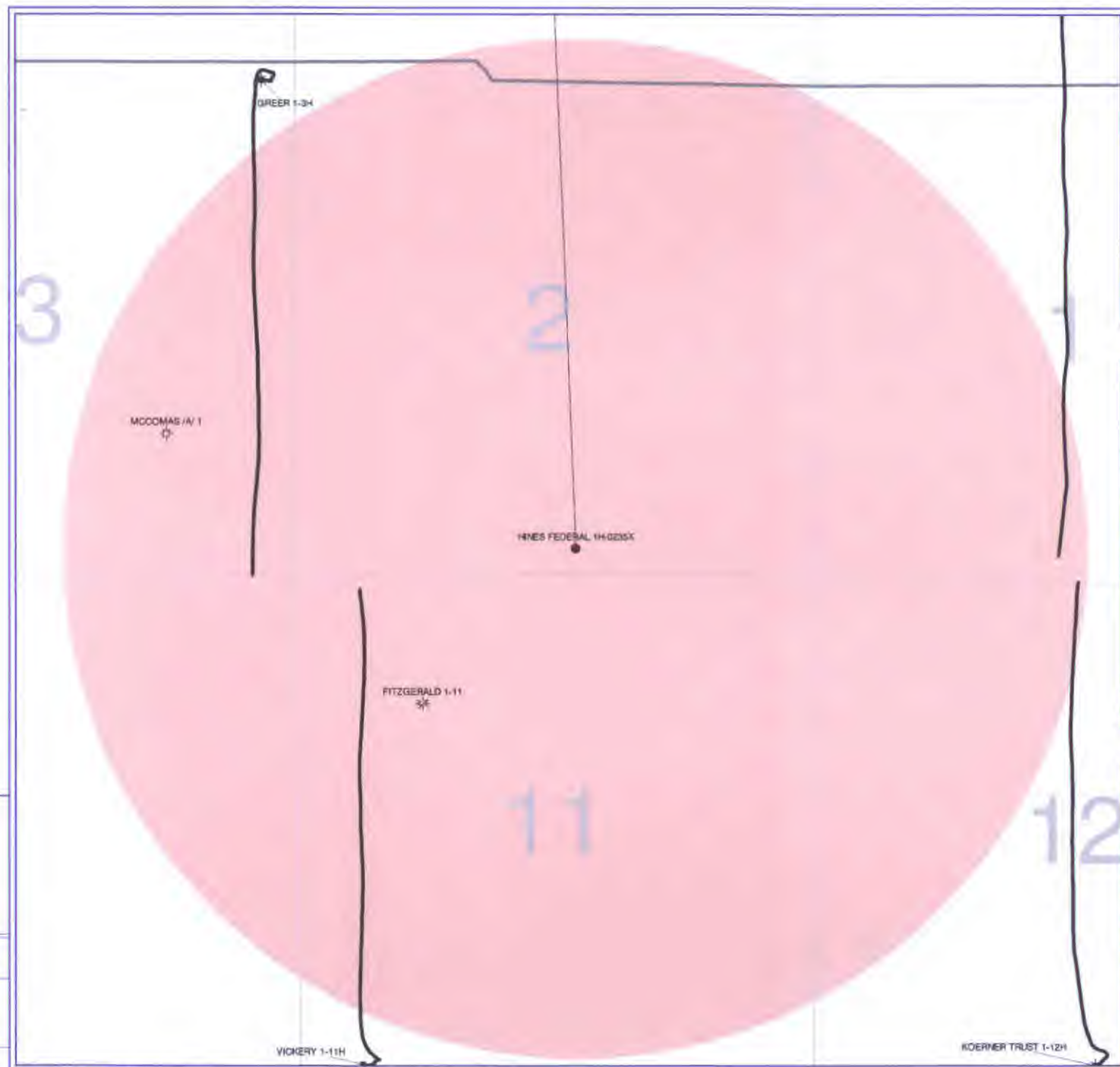


ONE MILE RADIUS PLAT

2-10N-8W

HINES FEDERAL 1H-0235X PROPOSED LOCATION

September 21, 2016



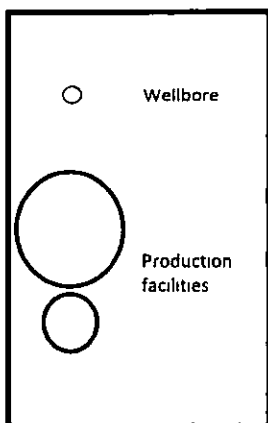
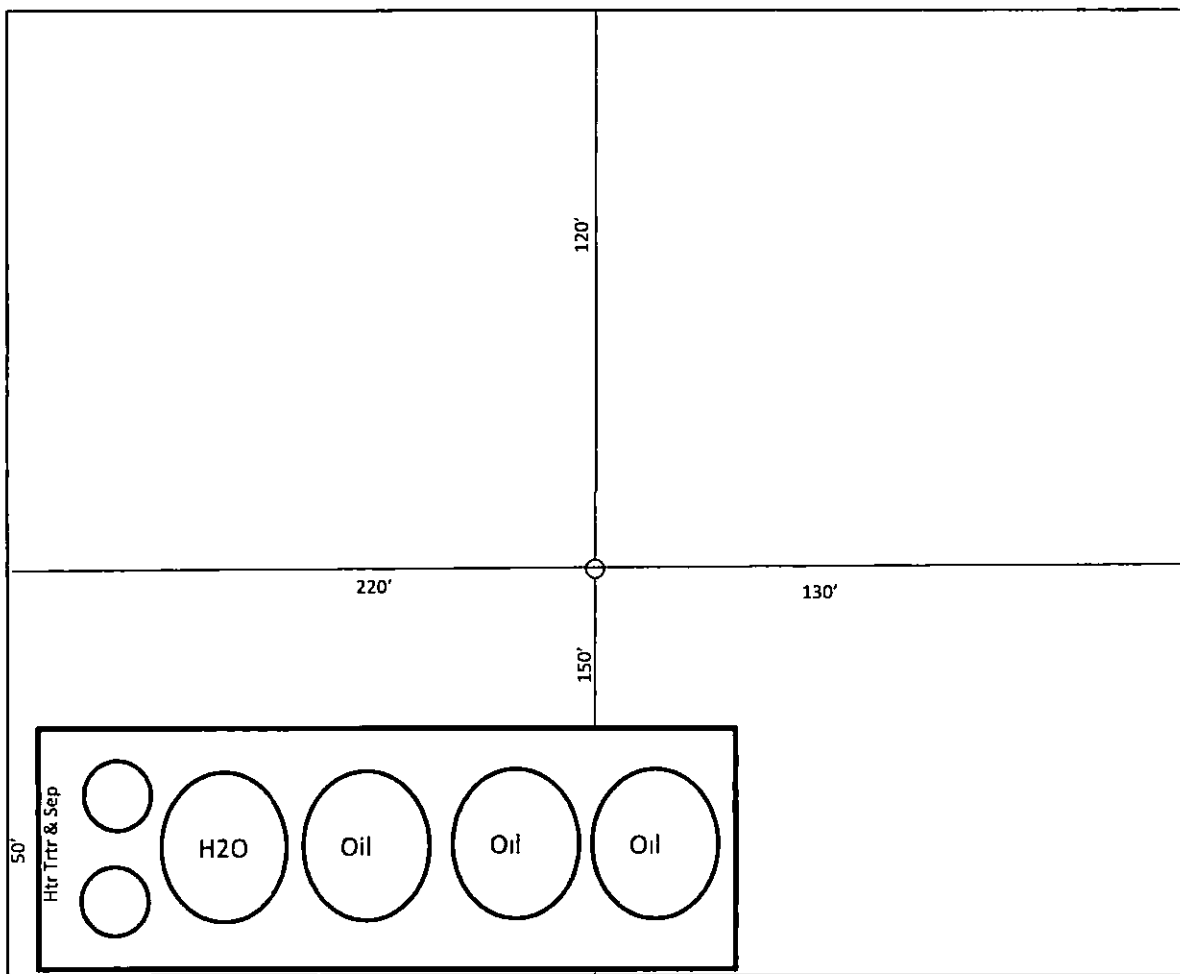







Exhibit E
 Preliminary Production Facility Diagram
Hines Federal 1H-0235X
 Cimarex Energy Co.
 2-10N-8W
 Grady Cty, OK

Legend

-  Hines Fed 1H0235X
-  South Canadian River Access
-  Water Path for Hines Fed 1H0235X

 Hines Fed 1H0235X

1140

South Canadian River Access 

Google earth

© 2016 Google

300 ft

N

**Construction Material Source
Cimarex Energy Co.
Hines Federal 1H-0235X**

Hoskins Gypsum Co.

Contact

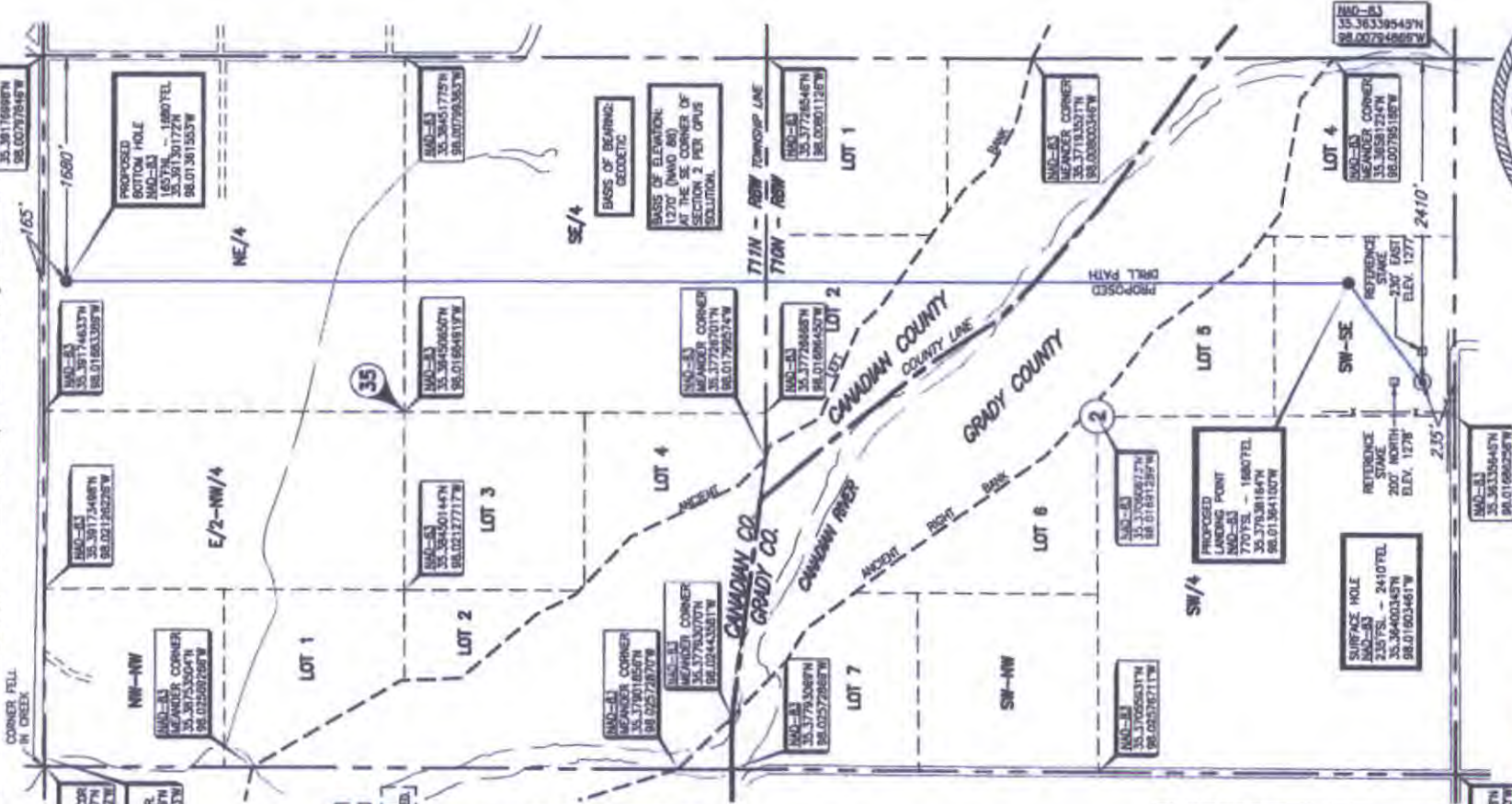
Hoskins Enterprises
PO Box 144
Longdale, OK 73755
hoskinstrucking@pdi.net
Tel: 580-274-3446
Fax: 580-274-3414

GRAPHIC LAND SURVEYORS OF OKLAHOMA

6708 NORTH CLASS. 35.364003457N
JCT. OKLA. CITY, OKLA. 73116 - LOCAL (405) 843-4847 - OUT OF S.
Certificate of Authorization No. 125315

307 854-3219

County, Oklahoma
GRADY
235' FSL - 2410' FEL Section 2 Township 10N Range 8W I.M.



Revision 1.1 Date of Drawing: October 25, 2016
Invoice # 266133 Date Staked: October 10, 2016 JGW

CERTIFICATE:

I, Thomas L. Howell, a Oklahoma Licensed Land Surveyor and an authorized agent of Topographic Land Surveyors of Oklahoma, do hereby certify to the information shown herein.

Thomas L. Howell
Oklahoma Lic. No. 1433

DATUM: NAD-83

LAT: 35.364003457N

LONG: 98.016034611W

(This information was gathered with a GPS receiver with ±1 foot horizontal accuracy)

Operator: CIMAREX ENERGY CO.
Lease Name: HINES FEDERAL Well No.: 1H-0235X
Topography & Vegetation Location fell on level grass pasture, ±200' North of powerlines, ±220' East of fence.
Good Drill Site? Yes Reference Stakes or Alternate Location
Stakes Set Ref. Stake 200' North, Elev. 1278'; 230' East, Elev. 1277'
Best Accessibility to Location From South off county road
Distance & Direction from Hwy Jct or Town From the Jct. of U.S. Hwy. 81 and St. Hwy. 37, go ±4.5 miles West on St. Hwy. 37, then ±2 miles North to the SW corner of Section 2, T10N - R8W

ELEVATION:
1278' Gr. at Stake (NAD-88)

(THE INFORMATION SHOWN HEREIN IS FOR CONSTRUCTION PURPOSES ONLY)

BOTTOM HOLE LANDING POINT & DRILL PATH PROVIDED BY OPERATOR LISTED, NOT SURVEYED.

County, Oklahoma

235' FSL - 2410' FEL Section 2 Township 10N Range 8W 1.M.
 CORNER FELL IN CREEK



Operator: CIMAREX ENERGY CO.

Lease Name: HINES FEDERAL

Well No.: 1H-0235X

Topography & Vegetation Location fell on level grass pasture, ±200' North of powerline, ±220' East of fence.

Good Drill Site? Yes

Reference Stakes or Alternate Location

Stakes Set Ref. Stake 200' North, Elev. 1278'; 230' East, Elev. 1277'

Best Accessibility to Location From South off county road

Distance & Direction

from Hwy Jct or Town From the Jct. of U.S. Hwy. 81 and St. Hwy. 37, go ±4.5 miles West on St. Hwy. 37, then ±2 miles North to the SW corner of Section 2, T10N - R8W

ELEVATION:

1278' Gr. at Stake (NAD-88)

Revision # 2661.35 Date of Drawing: October 25, 2016
 Invoice # 2661.35 Date Staked: October 10, 2016 JOW

CERTIFICATE:

I, Thomas L. Howell, a Oklahoma Licensed Land Surveyor and an authorized agent of Topographic Land Surveyors of Oklahoma, do hereby certify to the information shown herein.

DATUM: NAD-83

LAT: 35.384003457N

LONG: 98.016034817W

This information was collected with a GPS receiver with ±1 foot horiz./vert. accuracy

Oklahoma Lic. No. 1433



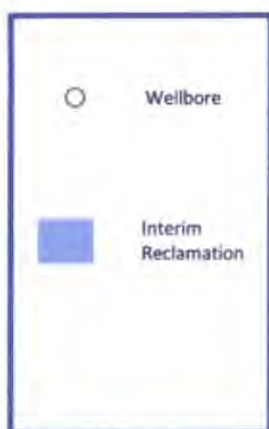
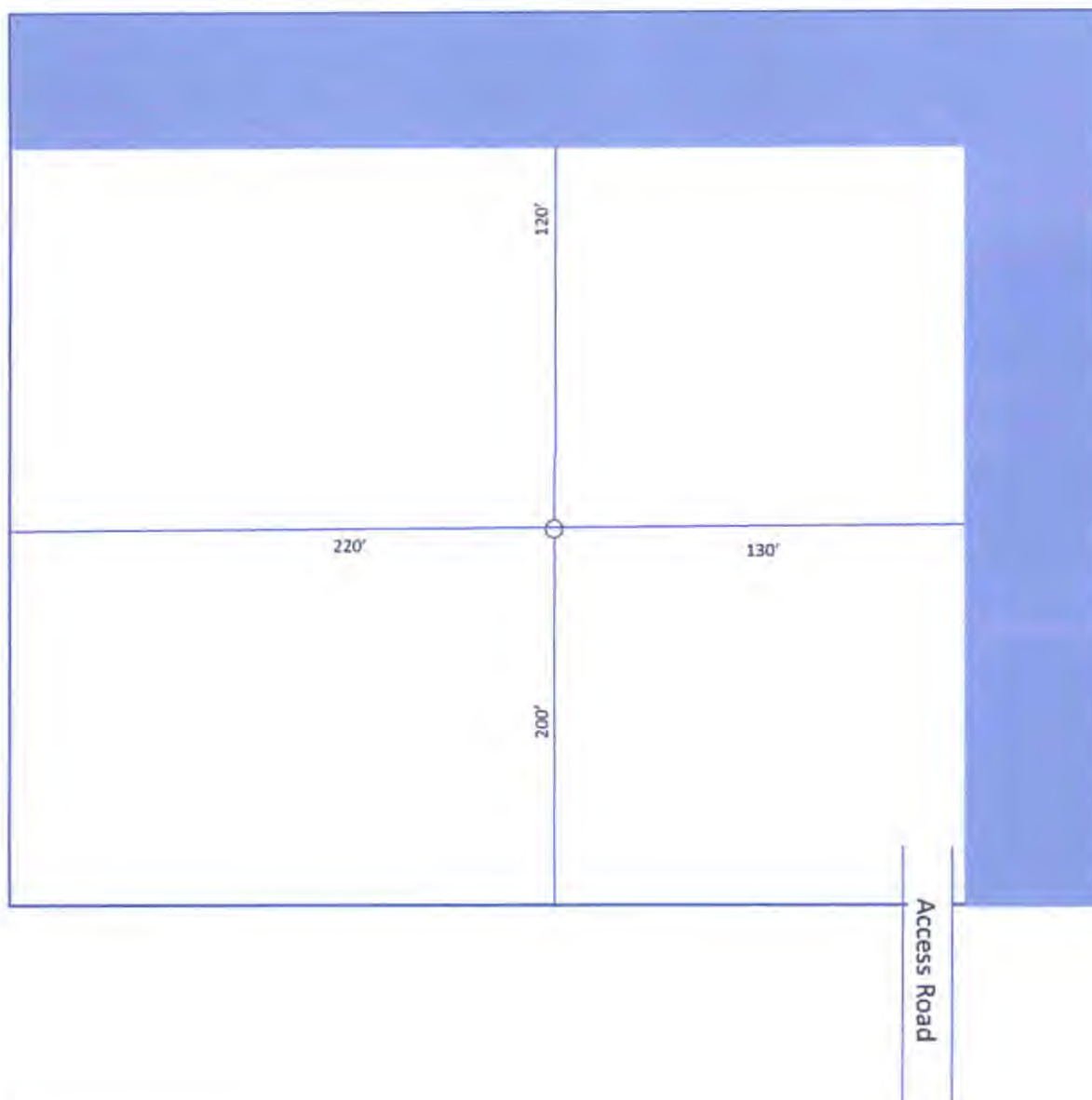


Exhibit D-1
Interim Reclamation Diagram
Hines Federal 1H-0235X
Cimarex Energy Co.
2-10N-8W
Grady Cty, OK

Surface Use Plan
Hines Federal 1H-0235X

Cimarex Energy Co.
Sec. 2, 10N, 8W
Grady Co., OK

The following surface use plan of operations will be followed and carried out once the APD is approved. No other disturbance will be created other than what is submitted in this surface use plan without approval. If any other disturbance is needed after the APD is approved, a BLM approved sundry notice or right of way application will be submitted for approval prior to any new surface disturbance.

1. Existing Roads:

- Please see Exhibit B and C-1 for existing access road planned to be used to access the proposed project.
- Cimarex Energy will improve or maintain existing roads in a condition the same as or better than before the operations began. Cimarex Energy will repair pot holes, etc. All existing structures on the entire access route such as cattle guards, other range improvement projects, culverts, etc. will be properly repaired or replaced if they are damaged or have deteriorated beyond practical use.
- Cimarex Energy will prevent and abate fugitive dust as needed, whether created by vehicular traffic, equipment operations, or other events.
- Cimarex Energy will obtain written BLM approval prior to the application of surfactants, binding agents, or other dust suppression chemicals on the roadways.
- The maximum width of the driving surface will be 14'. The road will be crowned and ditched with a 2% slope from the tip of the crown to the edge of the driving surface. The ditches will be 1' deep with 3:1 slopes. The driving surface will be made of 6" rolled and compacted caliche.
- Existing access road route to the proposed project is depicted on the public access point map if applicable. Improvements to the driving surface will be done where necessary. No new surface disturbance will be done, unless otherwise noted in the New or Reconstructed Access Roads section of the surface use plan.

2. New or Reconstructed Access Roads:

- A new road will be constructed for this project.
- Cimarex Energy plans to construct 35' of new on-lease access road to service the well. The planned access road does not cross lease boundaries, a right of way grant will not be acquired from the BLM.
- The maximum width of the driving surface will be 14'. The road will be crowned and ditched with a 2% slope from the tip of the crown to the edge of the driving surface. The ditches will be 1' deep with 3:1 slopes. The driving surface will be made of 6" rolled and compacted caliche.
- Proposed and existing access road route to the proposed wellsite is depicted on Exhibit C-2. Improvements to the driving surface will be done where necessary. No new surface disturbance will be done without prior approval from the BLM.
- The operator will prevent and abate fugitive dust as needed, whether created by vehicular traffic, equipment operations, or other events.

3. Well Radius Map

Please see Exhibit A for wells within one mile of the proposed well SHL and BHL.

4. Proposed or Existing Production Facilities:

- If on completion this well is a producer, a tank battery will be used and the necessary production equipment will be installed at the wellsite. Any changes to the facility will be submitted via sundry notice.

5. Gas Pipeline

- Please see Exhibit G-2 for proposed pipeline route.

6. Flowlines

- Battery located on pad.

7. Salt Water Disposal

- No pipeline proposed.

8. Electric Lines

- No new electric lines are planned.

Surface Use Plan
Hines Federal 1H-0235X

Cimarex Energy Co.
Sec. 2, 10N, 8W
Grady Co., OK

9. Water

- **Drilling:** Cimarex Energy plans to purchase fresh water from a 3rd party company. A local commercial source will truck water utilizing the access road. Please see Exhibit C-2 for access road route.
- **Other:** Cimarex Energy will obtain a water use agreement from a private landowner and obtain an OWRB temporary water use permit in order to secure the water source. A temporary pipeline will be constructed to bring water from the private water source to the well

11. Methods of Handling Waste

- Drilling fluids, produced oil, and water from the well during drilling and completion operations will be stored safely and disposed of properly in a OCC approved disposal facility.
- Garbage and trash produced during drilling and completion operations will be collected in a trash container and disposed of properly at a state approved disposal facility. All trash on and around well site will be collected for disposal.
- Human waste and grey water will be properly contained and disposed of properly at a state approved disposal site.
- After drilling and completion operations, trash, chemicals, salts, frac sand and other waste will be removed and disposed of properly at a state approved disposal site.
- The well will be drilled utilizing a closed loop system. Drill cuttings will be properly disposed of into steel tanks and taken to an OCC approved disposal facility.

12. Ancillary Facilities:

No camps or airstrips to be constructed.

13. Well Site Layout:

- Exhibit D: Rig Layout
- Exhibit D-2: Well Site layout plat
- Mud pits in the closed circulation system will be steel pits and the cuttings will be stored in steel containment pits.
- Cuttings will be stored in steel pits until they are hauled to a state-approved disposal facility.
- If the well is a producer, those areas of the location not essential to production facilities will be reclaimed and seeded per BLM requirements. Exhibit D-1: Interim Reclamation Diagram.

14. Interim and Final Reclamation

- Rehabilitation of the location will start in a timely manner after all drilling operations cease. The type of reclamation will depend on whether the well is a producer or a dry hole.
- In areas planned for interim and final reclamation, surfacing materials will be removed and returned to a mineral pit or recycled to repair or build roads and well pads.
- Drainage systems, if any, will be reshaped to the original configuration with provisions made to alleviate erosion. These may need to be modified in certain circumstances to prevent inundation of the location's pad and surface facilities. After the area has been shaped and contoured, topsoil from the spoil pile will be placed over the disturbed area to the extent possible. Revegetation procedures will comply with BLM standards.
- If the well is a dry hole, the pad and road area will be re-contoured to match the existing terrain. Topsoil will be spread to the extent possible. Revegetation will comply with BLM standards.
- Should the well be a producer, those areas of the location not essential to production facilities and operations will be reclaimed and seeded per BLM requirements. Exhibit D-1 illustrates the proposed Interim Reclamation.

15. Surface Ownership:

- The wellsite is on surface owned by Bob Hines, 137 County St. 2750, Minco, OK 73059, 405-352-4929.
- A copy of Surface Use Agreement has been given to the surface owner. A copy of the Surface Access Agreement (SAA) has been given to the Surface Owner.
- The land is used mainly for farming, cattle ranching, recreational use, and oil and gas production.

Surface Use Plan
Hines Federal 1H-0235X
Cimarex Energy Co.
Sec. 2, 10N, 8W
Grady Co., OK

16. Other Information:

- Topography surrounding well pad is gently sloping. Proposed pad is located in rolling wheat fields.
- Archeological survey will be conducted for the well pad/location and proposed road and the arch report will be filed with the BLM.
- There are no known dwellings within 1/4 mile of this location.

17. On Site Notes and Information:

Onsite with Cimarex (Mike Unruh) and BLM (Craig Willems) on October 18, 2016.



ONEOK Gathering & Processing



Legend

- RL Meter Proposed
- RL Meter Approved
- RL Meter Under Construction
- RL Meter Inservice
- RL Valve
 - Proposed
 - Approved Design
 - Under Construction
 - In Service
- RL Major Sites (Plants & Comp)
 - Plant
 - Compressor
 - Storage
 - Trasating
- RL Minor Sites (Other)
 - Meter Site
 - Valve Site
 - Office
- Regulated
 - Transmission
 - FERC Regulated
 - Jurisdictional
 - NGGP Liquids
- Active
 - Gathering
 - HP Discharge
 - LP Discharge
- Inactive

Notes

Exhibit G-2

1.3 0 0.64 1.3 Miles

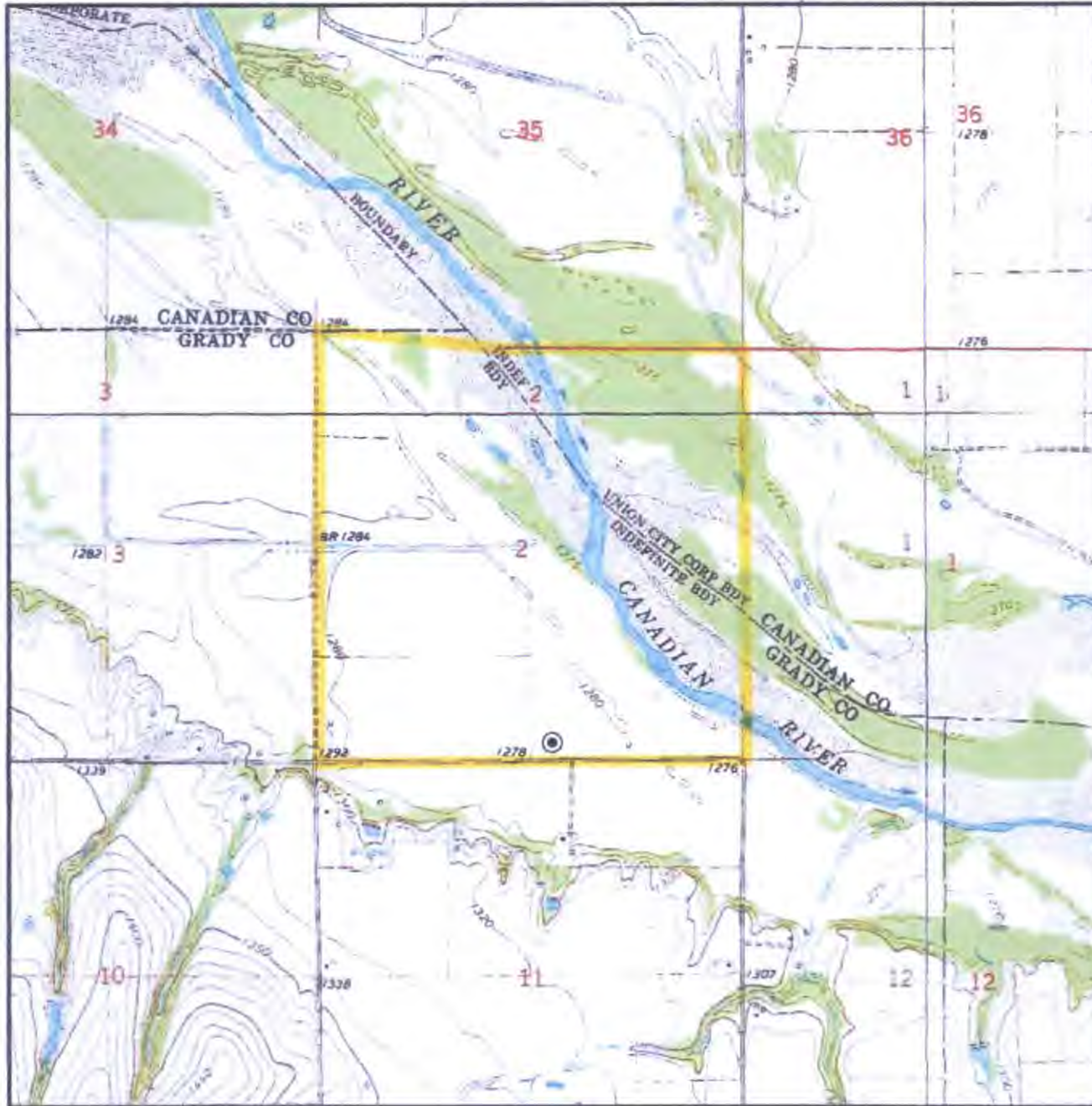
WGS_1984_Web_Mercator_Auxiliary_Sphere
© ONEOK

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA

Surveying and Mapping for the Energy Industry
6709 North Classen Blvd. Oklahoma City, OK 73116 www.topographic.com
Telephone Numbers: Local (405) 843-4847 Toll Free (800) 654-3219

LOCATION & ELEVATION VERIFICATION MAP



Sec. 2 Twp. 10N Rng. 8W I.M.

County GRADY State OK

Operator CIMAREX ENERGY CO.

Description 235'FSL - 2410'FEL

Lease HINES FEDERAL 1H-0235X

Elevation 1277' Gr. at Stake

U.S.G.S. Topographic
Quadrangle Map COGAR SE, OK

Above Background Data from
U.S.G.S. Topographic Map
Scale: 1"=2000'

Contour Interval 10'

When elevation is shown hereon it is the ground
elevation of the location stake.
Review this plat and inform us immediately of
any possible discrepancy.



LAND SURVEYORS OF OKLAHOMA

August 31, 2016

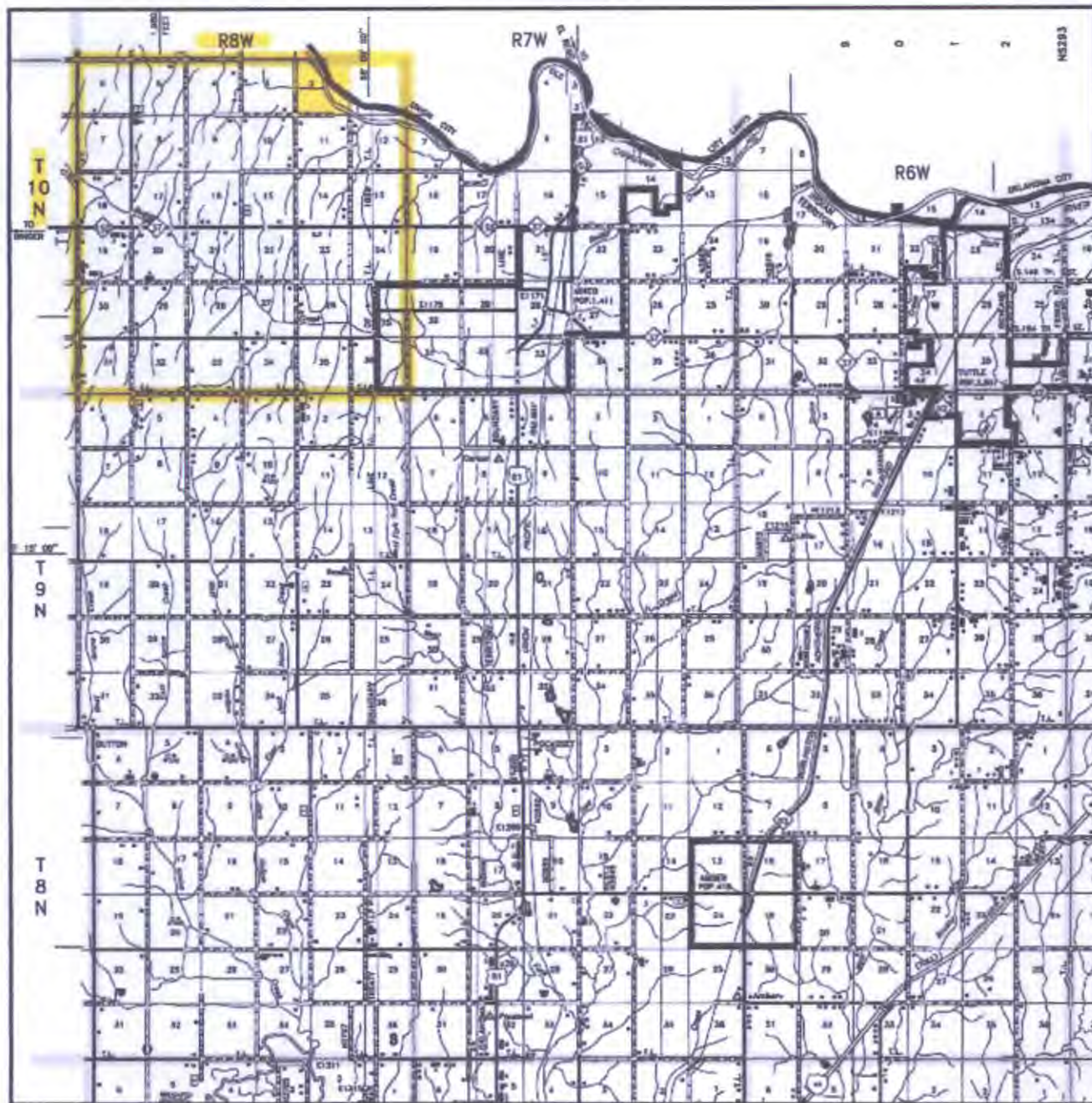
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6709 North Classen Blvd. Oklahoma City, OK 73116 www.topographic.com

Telephone Numbers: Local (405) 843-4847 Toll Free (800) 654-3219

VICINITY MAP



Scale: 1" = 3 Miles

Sec. 2 Twp. 10N Rng. 8W I.M.

County GRADY State OK

Operator CIMAREX ENERGY CO.



LAND SURVEYORS OF OKLAHOMA

11N 8W

JET G FARMS LLC

WOODS, JOHN A*

H & H LAND COMPANY LLC

H & H LAND COMPANY LLC

35

WOODS, JOHN A*

INDALL, RUBY ELISE ESTATE

WILLIAMS, WESLEY

LONGLEY, JAMES

CARR, RONALD J & RAINCY A TRUSTEES

Aricka Easterling

From: notification@pay.gov
Sent: Tuesday, November 01, 2016 12:10 PM
To: Aricka Easterling
Subject: [External] Pay.gov Payment Confirmation: BLM Oil and Gas Online Payment

Your payment has been submitted to Pay.gov and the details are below. If you have any questions regarding this payment, please contact BLM OC CBS Customer Service at (303) 236-6795 or BLM_OC_CBS_Customer_Service@blm.gov.

Application Name: BLM Oil and Gas Online Payment
Pay.gov Tracking ID: 25UP3TP3
Agency Tracking ID: 75121174054
Transaction Type: Sale
Transaction Date: 11/01/2016 01:10:01 PM EDT

Account Holder Name: Drilling Permits

Transaction Amount: \$9,610.00
Card Type: Visa
Card Number: *****4758

APD ID: 10400006204
Company: Cimarex Energy Co
Lease Number: OKNM20396
Well Name: Hines Federal
Well Number: 1H-0235X

Note: You will need your Pay.gov Tracking ID to complete your APD transaction in AFMSS II. Please ensure you write this number down upon completion of payment.

THIS IS AN AUTOMATED MESSAGE. PLEASE DO NOT REPLY.

AFFIDAVIT OF NOTIFICATION

STATE OF OKLAHOMA)
) SS.
COUNTY OF TULSA)

I, Alan Beers, of Cimarex Energy Co, 202 South Cheyenne Ave., Ste. 1000 Tulsa, OK 74132, being an authorized agent, upon oath states:

1. THAT, Cimarex Energy Co. has proposed a well to be drilled through NM 20396 and NM 28183 located in Section 2-10N-8W and Section 35-11N-8W.
2. THAT, the surface owner of the proposed location is:

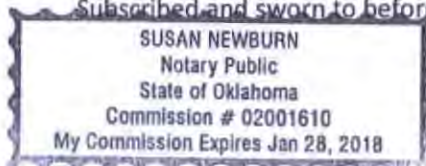
Robert and Carolyn Hines
137 County Street 2750
Minco, OK 73059

3. THAT, the above stated owner was contacted and invited to attend the scheduled staking of this well and has been sent a copy of the Surface Damage Agreement.
Further, Affiant sayeth not.



Alan Beers

Subscribed and sworn to before me on this 5th day of December, 2016.




Notary Public

My Commission Expires: 1-28-2018

My Commission Number: 02001610

ACCESS AGREEMENT
SE/4 Section 2-10N-8W
Grady County, Oklahoma

Robert and Carolyn Hines, ("Surface Owner"), has granted Authority to Cimarex Energy Co. ("Cimarex"), to enter onto the below described lands for all purposes necessary allowing Cimarex to proceed with its required permitting with the Bureau of Land Management.

HINES FEDERAL 1H-0235X

Surface:

SE/4 Section 2-10N-8W

Grady County, Oklahoma

Surface Owner and Cimarex have also entered into negotiations for a Surface Damage Agreement to allow Cimarex permanent access to the proposed well location.

Executed this 1st day of NOVEMBER, 2016.

CIMAREX ENERGY CO.

By: 

Printed Name: ALAN BEERS

Title: SR. LANDMAN

**SELF-CERTIFICATION STATEMENT FROM OPERATOR
FOR SURFACE OWNER SURFACE USE AGREEMENT**

Federal or Indian Lease Number: NM 20396, NM 28183

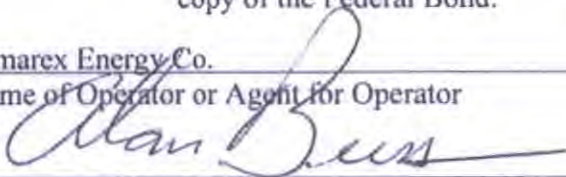
Well Name & Number: Hines Federal 1H-0235X

I hereby certify to the Authorized Officer of the Bureau of Land Management that I have reached one of the following agreements with the Surface Owner; after failure of my good-faith effort to come to an agreement of any kind with the Surface Owner, have provided a Federal Bond and will provide evidence of service of such Federal Bond to the Surface Owner:

1. X I have a signed access agreement to enter the leased lands;
2. I have a signed waiver from the Surface Owner;
3. I have entered into an agreement regarding compensation to the Surface Owner for damages for loss of crops and tangible improvements;
4. Because I have been unable to reach either 1, 2 or 3 with the Surface Owner, I have obtained a Federal Bond to cover loss of crops and damages to tangible improvements and served the surface owner with a copy of the surface owner with a copy of the Federal Bond.

Cimarex Energy Co.

Name of Operator or Agent for Operator



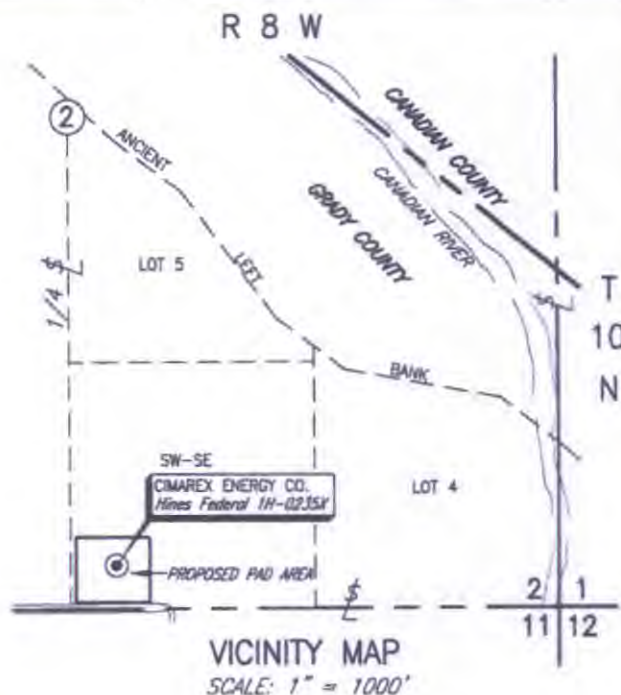
Signature of Operator or Signature of Agent for Operator

11, 1, 2016

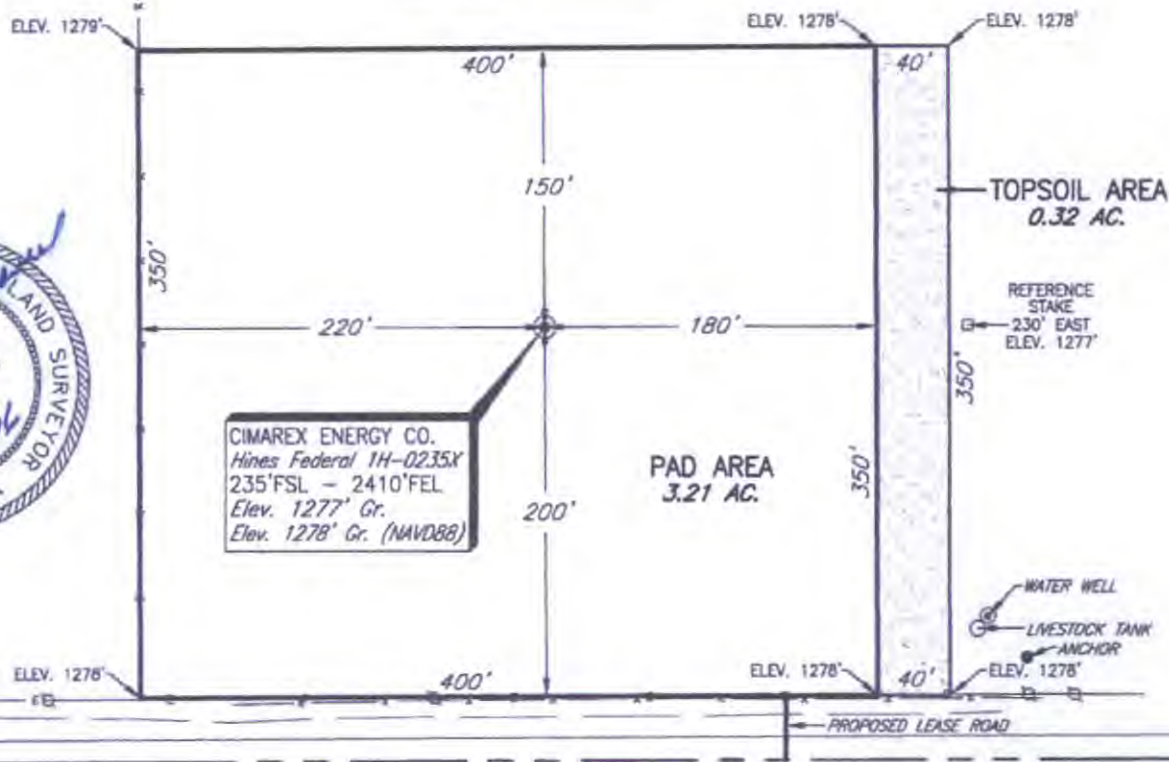
Date

T 10 N - R 8 W
(INDIAN MERIDIAN)

Exhibit D-2



REFERENCE
STAKE
200' NORTH
ELEV. 1278'



-NOTE-

The information shown herein is for construction purposes ONLY.

PLAT SHOWING
PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA

BASIS OF BEARING:
GEODETTIC

BASIS OF ELEVATION:
1270' (NAVD 88)
AT THE SE CORNER OF
SECTION 2 PER OPUS
SOLUTION.

				This plat was prepared exclusively for		SCALE: 1" = 100'
				CIMAEX ENERGY CO.		DATE: 10-11-16
				and may not be relied upon by any other entity without the written consent of Topographic Land Surveyors of Oklahoma.		INVOICE NO.: 266133
NO.	REVISION	DATE	BY	SURVEYING AND MAPPING BY		FILE: L4129A1.DWG
SURV. BY:	ES	10-10-16		TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA		DWG. NO.: 103134-L4-129-A1
DRAWN BY:	RKM			6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847		SHEET 1 OF 4
APPROVED BY:	TH			Certificate of Authorization No. 1293 LS		

T 10 N - R 8 W

(INDIAN MERIDIAN)

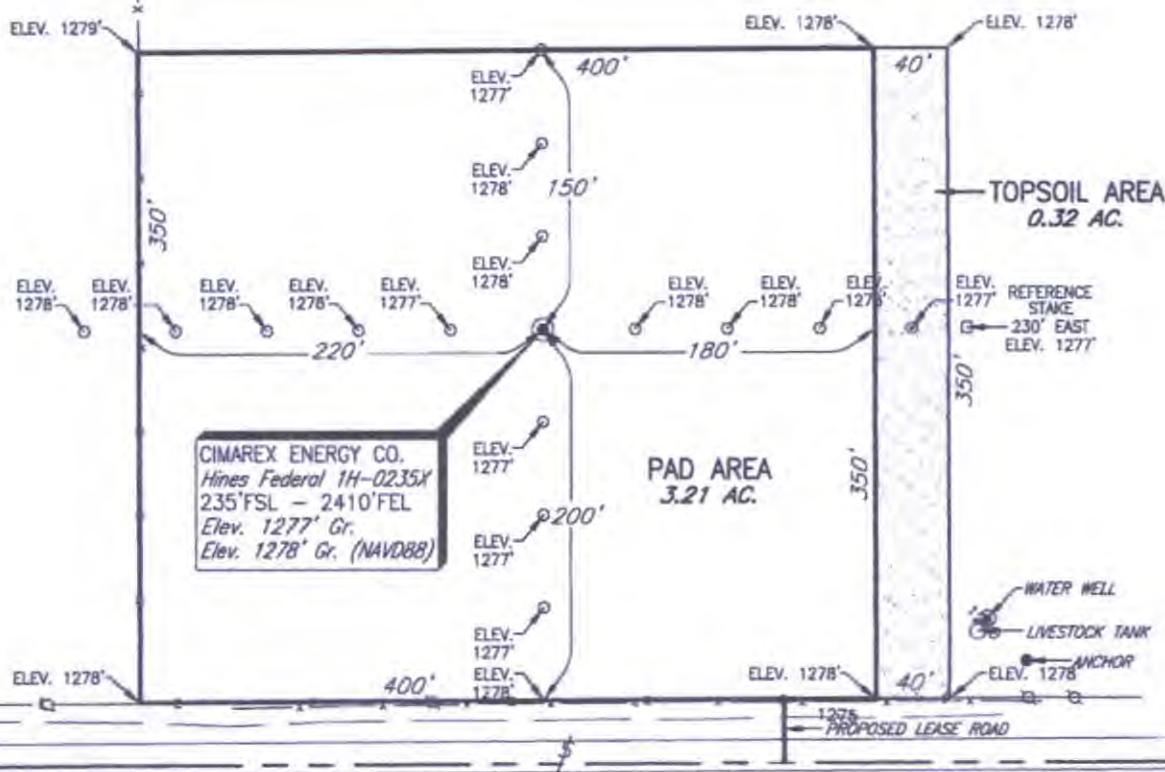
Exhibit D-2



-NOTE-
Elevations were taken at
50' intervals N., S., E.,
& W. of Location Stake.



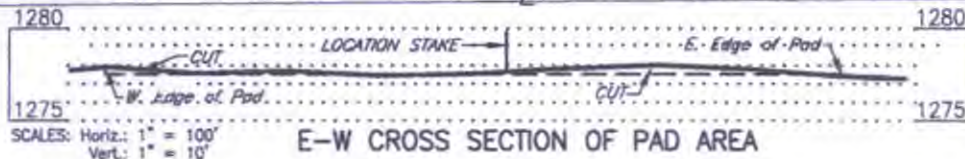
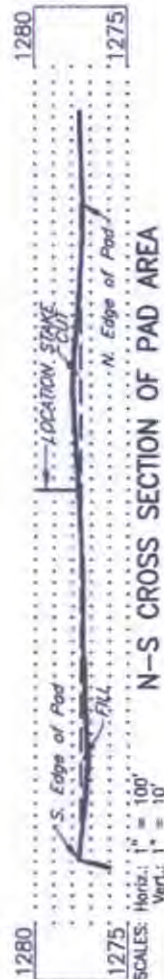
REFERENCE
STAKE
200' NORTH
ELEV. 1278'



CIMAREX ENERGY CO.
Hines Federal 1H-0235X
235'FSL - 2410'FEL
Elev. 1277' Gr.
Elev. 1278' Gr. (NAVD88)

PAD AREA
3.21 AC.

TOPSOIL AREA
0.32 AC.



E-W CROSS SECTION OF PAD AREA

PLAT SHOWING
CROSS SECTIONS OF A
PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA

-NOTE-

The information shown herein is for
construction purposes ONLY.

BASIS OF BEARING:
GEODETIC

BASIS OF ELEVATION:
1270' (NAVD 88)
AT THE SE CORNER OF
SECTION 2 PER OPUS
SOLUTION.

This plat was prepared exclusively for

CIMAREX ENERGY CO.

NO. REVISION DATE BY

SURV. BY: ES 10-10-16

DRAWN BY: RKM

APPROVED BY: TH

and may not be relied upon by any other entity without the written consent of Topographic Land Surveyors of Oklahoma.

**SURVEYING AND MAPPING BY
TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA**

6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847
Certificate of Authorization No. 1293 LS

SCALE: 1" = 100'

DATE: 10-11-16

INVOICE NO.: 266133

FILE: L4129A1.DWG

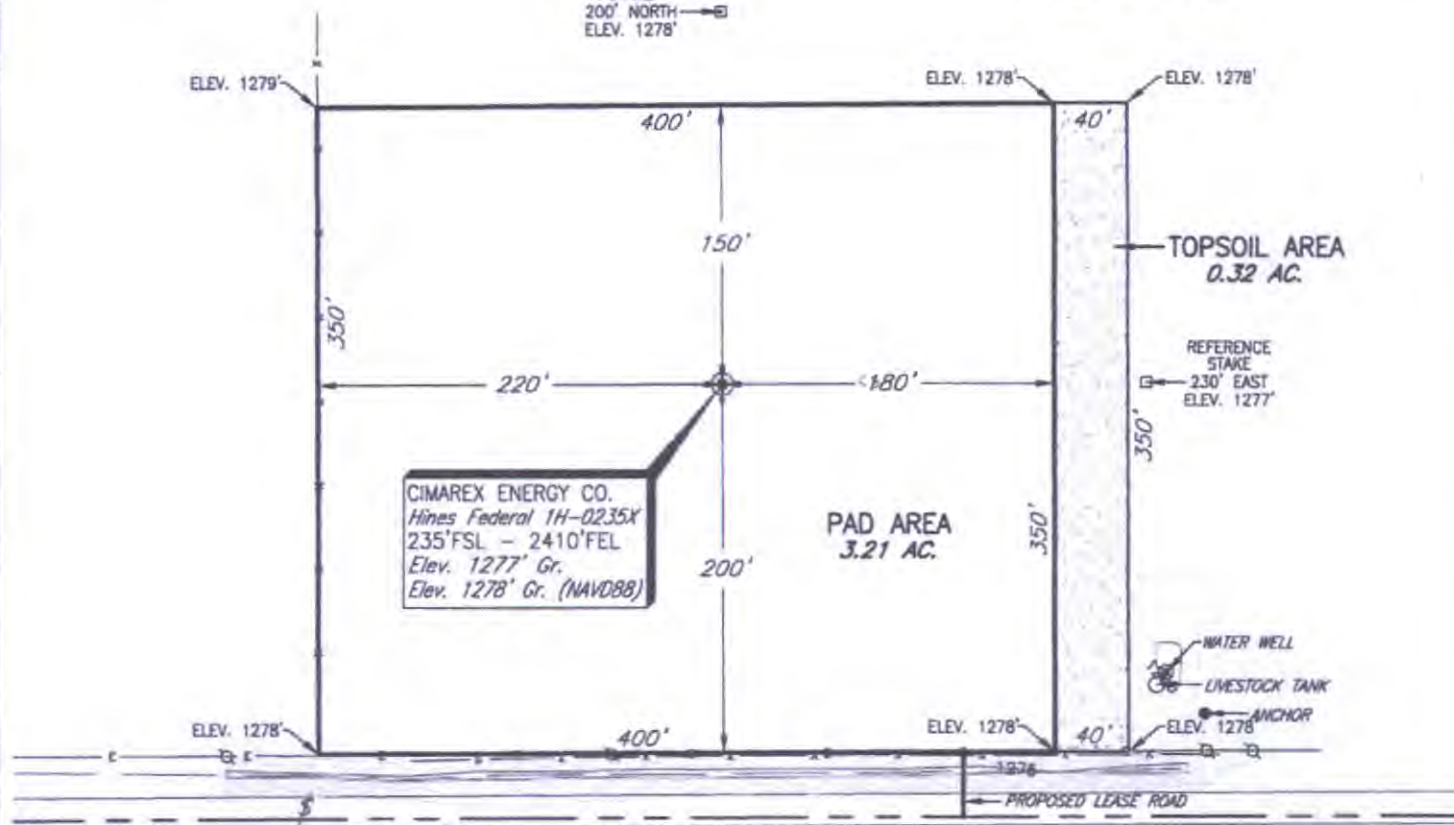
DWG. NO.: 103134-L4-129-A1

SHEET 2 OF 4

T 10 N - R 8 W
(INDIAN MERIDIAN)
Exhibit D-2



REFERENCE
STAKE
200' NORTH
ELEV. 1278'



-NOTE-

The information shown herein is for construction purposes ONLY.

**PLAT SHOWING
EXISTING CONTOURS OF A
PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA**

BASIS OF BEARING:
GEODETIC

BASIS OF ELEVATION:
1270' (NAVD 88)
AT THE SE CORNER OF
SECTION 2 PER OPUS
SOLUTION.

This plat was prepared exclusively for

CIMAEX ENERGY CO.

**SURVEYING AND MAPPING BY
TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA**

6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847
Certificate of Authorization No. 1293 LS

SCALE: 1" = 100'

DATE: 10-11-16

INVOICE NO.: 266133

FILE: L4129A3.DWG

DWG. NO.: 103134-L4-129-A3

SHEET 3 **OF** 4

NO.	REVISION	DATE	BY
SURV. BY:	ES	10-10-16	
DRAWN BY:	RKM		
APPROVED BY:	TH		

T 10 N - R 8 W
(INDIAN MERIDIAN)
Exhibit D-2

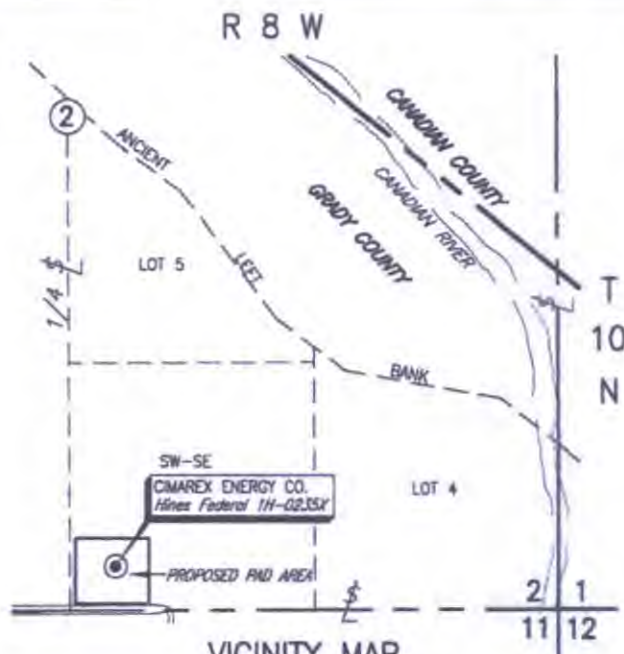


PAD REPORT

Top of pad elevation: 1277.5190
Cut Slope: 50.00% 2.00:1 26.57'
Fill Slope: 33.33% 3.00:1 18.43'
Balance Tolerance (C.Y.): 0.00
Cut Swell Factor: 1.00
Fill Shrink Factor: 1.00

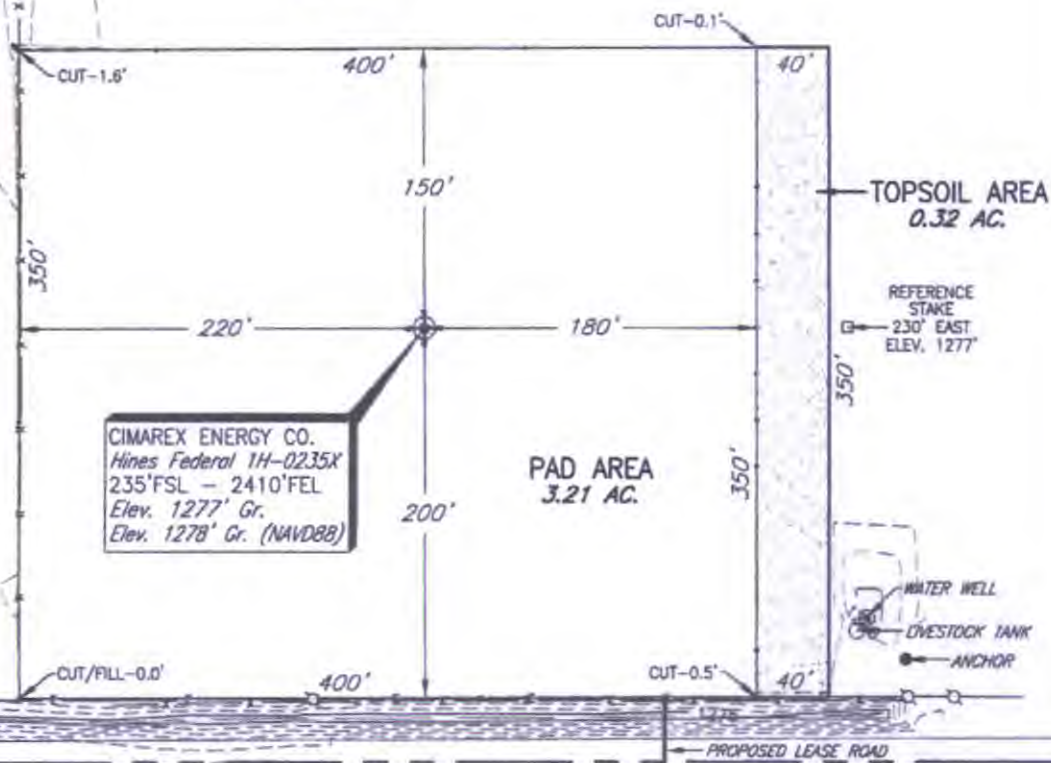
PAD EARTHWORK VOLUMES

Total cut : 16,246.1 C.F., 601.71 C.Y.
Total fill: 16,199.6 C.F., 599.98 C.Y.
Balance Export: 46.6 C.F., 1.73 C.Y.
Area: 140788.9 Sq. Ft., 3.232 Acres



VICINITY MAP
SCALE: 1" = 1000'

REFERENCE
STAKE
200' NORTH
ELEV. 1276'



-NOTE-

The information shown herein is for construction purposes ONLY.

**PLAT SHOWING
FINAL CONTOURS OF A
PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA**

BASIS OF BEARING:
GEODETTIC

BASIS OF ELEVATION:
1270' (NAVD 88)
AT THE SE CORNER OF
SECTION 2 PER OPUS
SOLUTION.

This plat was prepared exclusively for				CIMAREX ENERGY CO.		SCALE: 1" = 100'	
and may not be relied upon by any other entity without the written consent of Topographic Land Surveyors of Oklahoma.				SURVEYING AND MAPPING BY		DATE: 10-12-16	
TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA				6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847		INVOICE NO.: 266133	
Certificate of Authorization No. 1293 LS				FILE: L4129A4.DWG		DWG. NO.: 103134-L4-129-A4	
NO.	REVISION	DATE	BY	SHEET 4 OF 4			
SURV. BY:	ES	10-10-16					
DRAWN BY:	RKM						
APPROVED BY:	TH						

**U.S. Department of the Interior
Bureau of Land Management**

**Decision Record
Finding of No Significant Impact
Environmental Assessment
DOI-BLM-NM-040-2017-004-EA
January 25, 2017**

Hines Federal No. 1H-0235X

*T10N R8W Sec 2
Grady County, Oklahoma*

U.S. Department of the Interior
Bureau of Land Management

Oklahoma Field Office
201 Stephenson Parkway, Suite 1200
Norman, OK 73019
405-579-7100



**DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
OKLAHOMA FIELD OFFICE**

Project: Hines Federal No. 1H-0235X
EA Number: DOI-BLM-NM-040-2017-004-EA
Location: T10N R08W Sec 2, Grady County, OK

Decision Record

DECISION: It is my decision to authorize and approve one (1) Application for Permit to Drill (APD), submitted by Cimarex Energy CO (Cimarex). Based upon the analysis provided, Alternative B—Proposed Action is approved as described in the attached Environmental Assessment (EA). Approval is based upon the APDs as submitted and all stipulations and Conditions of Approval (COAs) attached to the permit. The approved activity includes: drilling one horizontal well to a maximum depth of 22,071 feet; constructing one 3.54-acre drill pads, constructing a 35 foot new lease road with a 90-foot maintained running width (0.07 acres), installing a total of 15,584 feet of pipeline with a 100-foot initial right-of-way (36.40 acres) reverting to a 50-foot permanent right-of-way; and installing associated infrastructure, production facilities and equipment. Infrastructure may include: wellheads, separator/dehydrator units, gas metering units, and above-ground condensate and produced water tanks. The wells would be drilled entirely on fee (private) surface using a closed-loop system. Final reclamation would occur on all disturbed surfaces, not already reclaimed, after final plugging and abandonment of the well. Short-term impacts would occur on approximately 40.01 acres, while 2.64 acres would have long-term impacts as a result of implementing the proposed action.

- Alternative B—Proposed Action is the environmentally-preferred alternative.
- Alternative B does not result in any further undue or unnecessary environmental degradation.
- Operator has provided a Surface Use Agreement entering into with the surface owner.
- Complying with Best Management Practices, Mitigation Measures, and COAs will alleviate or minimize environmental impacts.

RATIONALE: The Bureau of Land Management staff have reviewed the environmental assessment and identified site-specific mitigation measures to avoid or minimize surface impacts resulting from implementation of the project. The production well pad and access road will remain as long-term impacts. The cumulative impacts to the environment from existing and new development have been identified. The proposed action is in conformance with the standard lease terms and conditions for Indian oil and gas leases as outlined in Form AAO-81 for lease number OKNM 20396; and the "General Requirements for all Federal and Indian Oil and Gas leases" administered by the BLM Oklahoma Field Office.

ADMINISTRATIVE REVIEW AND APPEAL: Under BLM regulations, this decision record is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this decision record must include information required under 43 CFR 3166.3(b) (State Director Review),

including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, New Mexico State office, 301 Dinosaur Trail, Santa Fe, NM 87508, no later than 20 business days after this Decision Record is received or considered to have been received.

Any party who is adversely affected by the State Director's decision may appeal that decision to the Interior Board of Land Appeals, as provided in 43 CFR 3166.4.

Approved by:



Robert Pawelek

Field Manager, Oklahoma Field Office

13 April 2017

Date

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
OKLAHOMA FIELD OFFICE

Project: Hines Federal No. 1H-0235X
EA Number: DOI-BLM-NM-040-2017-004-EA
Location: T10N R8W Sec 2, Grady County, OK

Finding of No Significant Impact

Based on the analysis of the potential environmental impacts of the proposed action in the attached environmental assessment, I have determined that Alternative B—Proposed Action is not expected to have significant impacts on the environment and that preparation of an Environmental Impact Statement is not required.

Prepared by

Craig Willems
Natural Resource Specialist

Date: _____

Reviewed by

Becky Peters
Planning & Environmental Specialist

Date: _____

Recommended by:



Carolyn Russell
Assistant Field Manager – Multi-Resources

Date: 4/13/17

Approved by:



Robert Pawelek
Field Manager, Oklahoma Field Office

Date: 13 Apr 2017

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1.0 INTRODUCTION

This Environmental Assessment (EA) has been prepared to evaluate Cimarex Energy CO (Cimarex). Cimarex submitted one application for permit to drill (APD) affecting Federal minerals in Grady County, Oklahoma. The development of oil and gas constitutes a Federal action that is subject to evaluation by the Bureau of Land Management (BLM) under the National Environmental Policy Act (NEPA). This EA is an assessment of potential impacts that could result with the implementation of either the Proposed Action or the No Action Alternative. An EA also provides evidence for determining whether the BLM will make a "Finding of No Significant Impact" (FONSI)

A FONSI is a document that briefly presents the reasons why implementation of the preferred alternative would not result in significant environmental impacts. As defined by the Council on Environmental Quality (CEQ), the significance of a Federal action is determined by the context of the action in relation to the overall project setting, as well as the intensity of direct, indirect and cumulative effects resulting from the project. If the BLM determines that the preferred alternative would not result in significant impacts, a Decision Record (DR) and FONSI would be prepared approving the selected alternative. If the project is found to result in significant impacts, an Environmental Impact Statement (EIS) would be prepared.

1.1 Background

Cimarex submitted one (1) complete APD to the Oklahoma Field Office (OFO) to develop oil resources within the lease on September 28, 2016. The project area located east of Cement, Oklahoma, in Grady County, Oklahoma (Appendix 1—Figure 1). All project actions would occur on fee surface.

Cimarex proposes to drill one horizontal well to a maximum depth of 22,071 feet; constructing one 3 54-acre drill pads; constructing a 35 foot new lease road with a 90-foot maintained running width (0.07 acres), installing a total of 15,584 feet of pipeline with a 100-foot initial right-of-way (36.40 acres) reverting to a 50-foot permanent right-of-way; and installing associated infrastructure, production facilities and equipment. Infrastructure may include wellheads, separator/dehydrator units, gas metering units, and above-ground condensate and produced water tanks. The wells would be drilled entirely on BIA managed surface using a closed-loop system. Final reclamation would occur on all disturbed surfaces, not already reclaimed, after final plugging and abandonment of the well. Short-term impacts would occur on approximately 40.01 acres, while 2.64 acres would have long-term impacts as a result of implementing the proposed action.

Land uses surrounding the Project Area are predominantly agricultural and livestock production related activities with obvious oil and gas influences in the area (Appendix A—Figures 3 for pictures). The proposed disturbance areas are currently cultivated wheat field.

1.2 Purpose and Need and Decision to be Made

The purpose of the Proposed Action is to develop oil and gas resources within Federal Lease OKNM 20396 and is consistent with existing Indian mineral leasing rights. The wells, pads, access roads, and

pipelines, are required to develop energy resources, thus reducing U.S. dependence on imported supplies, and meet the intent of Executive Order 133212 dated May 18, 2001 and the Energy Policy Act of 2005 which emphasize the development of domestic oil and natural gas reserves for supply and economic stability.

The Indian Mineral Leasing Act of 1938 (IMLA) grants the Bureau of Indian Affairs (BIA) the authority to issue Indian (allotment) mineral leases for the exploration of oil and gas and allows for the development of those leases. The leases are a binding legal contract or agreement that allows and provides for the development of the mineral by the lease holder, within a specified timeframe.

The decision to be made by the BLM is whether to approve the one APD submitted by Cimarex for the Hines Federal No. 1H-0235X.

1.3 Land Use Plan Conformance

The Proposed Action is the result of an oil and gas lease issued by the BLM and is in conformance with the standard lease terms and conditions for Indian oil and gas leases as outlined in Form AAO-81 for lease numbers OKNM 20396; and the "General Requirements for all Federal and Indian Oil and Gas leases" administered by the BLM-Oklahoma Field Office. This lease, and as such, is addressed in the Oklahoma RMP/ROD (1994) for the Public Lands Administered by the BLM, Oklahoma Field Office, as required by 43 CFR 1610.5.

1.4 Federal, State, or Local Permits, Licenses or Other Consultation Requirements

This EA has been prepared in accordance with NEPA and is in compliance with all applicable regulations and laws subsequent thereto, including CEQ regulations (40 CFR 1500-1508). This document has been prepared according to directions contained in BLM Manual Handbook H-1790-1, covering the development of NEPA documents. The Proposed Action would conform to other applicable Federal and State regulations which may be required for project implementation. If any non-compliance is identified during the analysis, since the project was completed without BLM knowledge and prior NEPA analysis, the BLM will require the operator to become compliant prior to issuing the APD, ensuring the project is consistent with other Federal, State and local laws, rules and regulations.

Table 1. Major Federal, State and Local Permits and Approvals Required

Agency	Permit, Approval, or Action
Bureau of Land Management	Compliance with Onshore Orders #1-8, Energy Policy Act of 2005, and NEPA. Approval of the individual APDs for operations in Indian-owned mineral estate
US Fish and Wildlife Service	Conformance with the Endangered Species Act. Complete Section 7 consultation if an effect to Federally listed species is identified.
Oklahoma Historical Society	Conformance with the National Historic Preservation Act. Complete Section 106 consultation with the State Historic Preservation Office
Oklahoma Corporation Commission	Notice of Intent to Drill approved by the Commission

1.5 Identification of Issues

The OFO interdisciplinary team (IDT) conducted internal scoping by reviewing the proposed project and location to identify potentially affected resources and land uses. Following the August 7, 2016 onsite, the IDT identified resources and land uses present and affected by the proposed project and focused the analysis on those issues. The following questions were raised as issues to consider further:

- What effect *will* the proposed action have on atmospheric pollutants and contaminants?
- What effect *will* the proposed action have on climate change?
- What effect *will* the proposed action have on the watershed condition?
- What effect *will* the proposed action have on soil loss and contamination?
- What effect *will* the proposed action have on prime or unique farmlands?
- What effect *will* the proposed action have on water quality in stream systems?
- What effect *will* the proposed action have on floodplains, wetlands and riparian areas?
- What effect *will* the proposed action have on known and newly discovered artifacts or areas of cultural, paleontological, and archeological significance?
- What effect *will* the proposed action have on the spread of non-native species?
- What effect *will* the proposed action have on vegetation loss, fragmentation, and regrowth?
- What effect *will* the proposed action have on federally listed and state-listed species that have the potential to be located in the proposed project area?
- What effect *will* the proposed action have on Migratory Bird species?
- What effect *will* the proposed action have on wildlife and their habitat in general?
- What effect *will* the proposed action have on the management of fluid mineral drilling wastes produced and the potential for contamination in the proposed project area?
- What effect *will* the proposed action have on locatable minerals management?
- What effect *will* the proposed action have on visual quality?
- What effect *will* the proposed action have on state and local economies?
- What effect *will* the proposed action have on minority and low income populations?

Several issues were considered during project scoping but dismissed from detailed analysis because there would be no potentially significant effects related to the issues resulting from any of the alternatives presented below. The following elements are determined by the IDT, following onsite visits, reports submitted by Cimarex, and other data sources, to not be present:

- Areas of Environmental Concern
- Livestock Grazing
- Wild Horse and Burros
- Recreation
- Wild and Scenic Rivers
- Wilderness
- Cave and Karst
- Rights-of-way

2.0 PROPOSED ACTION AND ALTERNATIVES

This EA analyzes the impacts of the No Action and Proposed Action Alternatives relating to oil development within the lease area in Grady County, Oklahoma.

2.1 Alternative A—No Action

CEQ regulations require the consideration of the No Action alternative (40 CFR 1502.14). The BLM NEPA Handbook (H-1790-1) states that for EAs on externally initiated proposed actions, the no action alternative generally means that the action would not take place. Under this alternative, the BLM would not approve the drilling of the proposed well or associated construction of the well pad, access road, or pipelines on private surface in which the federal mineral estate would be accessed. Current land use practices in the project vicinity would likely continue. The area would remain available for other surface use activities. In the future, individual wells could be approved on a case-by-case basis, or oil and gas leases may be developed in a different location where resource concerns are not affected or can be mitigated. Any future proposals for development of Indian minerals would also require evaluation under NEPA.

Cimarex could proceed with the construction and development located on fee surface and fee mineral estate (fee/fee) to the extent that those wells would not impact Indian or Federal mineral estate.

2.2 Alternative B—Proposed Action

The Proposed Action is to approve one APD submitted by Cimarex. Cimarex proposes to construct, drill, and operate one horizontal oil well within the project area, including constructing one well pad, access road and pipeline for Federal Leases number OKNM 20396. All surface disturbances would occur on private/fee managed surface, while drilling would enter into federal mineral estate. Surface disturbances would occur in Grady County, Oklahoma approximately 5 miles northwest of Minco, Oklahoma (Appendix A—Figure 1).

All operations would be conducted in full compliance with all applicable laws, regulations (43 CFR 311 et al.), Onshore Oil and Gas Orders, the approved plan of operations/APD and any applicable Notices to Lessees. Operations in connection with drilling into Indian allotted minerals would be conducted in compliance with 43 CFR 2800 et al. All phases of the project would follow guidelines and standards as set forth in the joint BLM/US Forest Service (USFS) publication: Surface Operating Standards for Oil and Gas Exploration and Development (Fourth Edition) (BLM-USFS 2007), also known as the “Gold Book,” and the contractual requirements of any affected surface owner(s). Stipulations and Conditions of Approval (COA) (Appendix B) attached to this proposed action are considered BMPs to mitigate and minimize associated surface resource impacts and would be implemented during all phases of the project.

2.2.1 Construction Activities

Clearing of the proposed well pads and access roads would be limited to the smallest area possible to provide safe and efficient work areas for all phases of construction. Implementing the project would

result in a total of 40.01 acres of new disturbance (Table 2). Clearing would be accomplished by cutting, mowing and/or grading as necessary. Cut vegetation would be mulched and spread on site or hauled to a commercial waste disposal facility.

During the initial clearing for the project the top 6 inches of soil surface would be removed and stockpiled for use when the site is restored. Woody material would be removed prior to stockpiling the soil. Topsoil would be stockpiled on the east side of each pad. Stockpiles would be protected from traffic and erosion. Fugitive dust would be minimized during all construction activities by spraying the project area with water.

Construction of the access roads, well pads, and pipelines is anticipated to take 45 days.

Table 2. Summary of short-term and long-term surface disturbance activities proposed in the APD.

Activity	Size (feet)	Initial Disturbance (acres)	Interim Reclamation (acres)	Long-term Disturbance (acres)
Hines Federal No. 1H-0235X				
Well Pad	350 x 440*	3.54	0.97	2.57
Production Facility	On Pad	0.00	0.00	0.00
Access Road	35x 90	0.07	0.00	0.07
Pipeline	15,854 x 100	36.40	36.40	0
Total		40.01	37.37	2.64

*Well Pad acreages include the construction zones needed for cut/fill slopes and topsoil storage.

2.2.1.1 Well Pad

The proposed pads would be constructed using a bulldozer, grader, front-end loader, and/or track hoe. The working drill pad surface of the new drill pad would be 3.54 acres (Appendix A—Figure 2). The pad size requirements for the proposed wells is driven by a number of factors including the number of wells expected at the site, the equipment requirements for hydraulic fracturing (HF) operations, and the expected surface facility size. At this time, no additional wells are anticipated on the pad.

Cut and fills would be required for leveling the proposed well pad to create a final level surface elevation. Cimarex will haul in material to raise the pad approximately two (2) to three (3) feet. The fill material would be placed in compacted lifts or layers over the entire pad. Each lift would be compacted by rubber-tire, heavy equipment with compaction to visible non-movement of the embankment

material prior to beginning the next lift. The pad would then be dressed with a layer of crushed aggregate purchased from a commercial source.

Mitigation for erosion and to protect the natural drainage areas, erosion control methods would be implemented during the construction and production phases of the project. No slopes greater than 3:1 would be implemented in the construction of the well pad. The slopes of the well pad may be reseeded or replanted as necessary to ensure the integrity of the cuts and fills. Erosion mitigation such as silt fences and hay bales would be located as necessary around the well pad.

Permanent fencing may be placed around the pad.

2.2.1.2 Pits

The wells will be drilled using a closed-loop system, so no pits are necessary.

2.2.1.3 Access Roads

From the town of Minco, OK go north on HWY 81 for approximately one (1) mile, then turn left (west) on HWY 37, go approximately 4.5 miles and turn right (north) on County Road N2790, go two (2) miles then turn right (east) on County Road E1140 for approximately a half mile; the proposed project is on the north side of the road. All existing Federal, State, and County roadways which may be utilized during the proposed action would be maintained and, where necessary, improved in accordance with the rules and regulation of applicable Federal, State, and/or County transportation department and their governing bodies. Federal, State, and County permits would be acquired where necessary.

Approximately 35 feet of new lease road would be constructed to access the Hines Federal No. 1H-0235X. The road would have a 90-foot wide right-of-way to allow for trucks turning in and out of the location. The road would be built up to match existing road grades and be crowned and ditched using bulldozers, graders, track hoes, or maintainers. Topsoil would be removed and stockpiled and a roadway roughed-in. All roads would be constructed to accommodate anticipated loads of haul trucks (gravel, drilling mud, water, and drill rigs), construction equipment, and personnel vehicular traffic.

The driving surface would be dressed with aggregate to create an all-weather road. Maintenance activities of the running width may include adding aggregate, reshaping, compacting, and/or crowing the road as necessary. Any ruts, rills, and eroded areas would be filled as necessary.

A cattle guard would be installed at the entrance of the existing lease road. A culvert would be installed to allow access across the county road bar-ditch. If the cattle guard or culvert wear out or are insufficient to support vehicular traffic, a replacement would be installed in the existing location.

2.2.1.4 Pipelines/Utility Lines

15,854 feet of pipeline would be installed for the Hines Federal No. 1H-0235X. The natural gas pipeline route would commence along the north edge of the well pad and traverse northeast for 15,854 feet.

where it ties into an existing gas gathering line. The maximum width of the pipeline right-of-way would be 100 feet during construction and would convert to a 50 foot permanent right-of-way once installed.

Construction of all pipelines would be in accordance with standard pipeline industry practices to assure prudent and safe operations and use of the land and in accordance with the conditions and stipulation of the BLM. The 50-foot wide right-of-way would be graded as necessary to provide a suitable work surface. A backhoe and/or trencher would be used to dig a pipeline trench to a depth suitable for allowing 48 inches of cover over the buried pipeline. Trenching operations would utilize the double trenching method where the topsoil would be segregated from that of the subsoil.

After the trench is dug, the pipes would be assembled by welding pieces of pipe together and bending them slightly, if necessary, to fit the contour of the pipeline's path. Each pipeline undergoes hydrostatic testing prior to natural gas being pumped through the pipeline. This ensures the pipeline is strong enough and absent of any leaks. Once inspected, the pipe can be lowered into the trench and covered with stockpiled subsoil that was originally removed from the hole.

Upon placement of the pipeline into the trench, the trench would be backfilled by first replacing the subsoil followed by the topsoil. The topsoil would be crowned over the trench to allow for settlement of the soils. Restoration would commence immediately upon backfilling of the trench. Equipment, debris, and materials used in the construction and placement of the pipeline would be removed from the right-of-way. All trash would be hauled away and disposed of in an approved manner. The right-of-way would be graded as necessary to restore slopes and contours as near as practicable to pre-construction conditions. The soil would be ripped and disked, unless otherwise specified by the landowner, to prepare its surface for a seedbed as specified in the landowner agreement. Erosion control techniques would be implemented when/where necessary.

Initially, the proposed pipeline construction would result in 40.01 acres of total disturbance. Since all of the entire pipeline disturbance area would undergo reclamation, the entire 40.01 acres of the disturbed area would be returned to near baseline conditions within one to two growing seasons. The remaining acres would be planted with vegetation to prevent erosion but would be maintained over the life of the wells through mowing.

2.2.2 Drilling Operations

When the pad is complete, the drilling rig and associated equipment would move onsite and be erected. A site-specific description of drilling procedures is included in the APD submitted to the BLM by Cimarex.

A conventional rotary drill rig with capability matched to the depth requirements of the proposed wells would be used. The well would be drilled as a vertical well targeting an exploratory field formation of the East Binger pool. The location of the well and proposed drilling depth is listed in Table 3.

Table 3. Proposed Action well names, locations, and drilling depth

Well	Latitude (NAD 83)	Longitude (NAD 83)	Vertical Depth (Feet)
Hines Federal No 1H-0235X	35 36394	98 01570	11,952

The proposed drilling operations include a closed-loop system for drilling fluids. Drilling fluid or mud would be circulated through the drill pipe to the bottom of the hole, through the bit, up the bore of the well, and finally to the surface. When mud emerges from the hole, it would pass through a series of equipment used to screen and remove drill cuttings (rock chips) and sand-sized solids. When the solids have been removed, the mud would be placed into holding tanks, and from the tank, pumped back into the well. The mud would be maintained at a specific weight and viscosity to cool the bit, seal off any porous zones (thereby protecting aquifers or preventing damage to producing zone productivity), control subsurface pressure, lubricate the drill string, clean the bottom of the hole, and bring the drill cuttings to the surface. Cimarex proposes to use a water-based mud. Once drilling is completed, mud would be disposed at an offsite commercial dump site.

No abnormal pressures zones are anticipated to be affected by drilling. The anticipated bottom hole pressure is less than 2,500 psi. No hydrogen sulfide gas or other potential hazards are anticipated.

Well drilling would last approximately 15 days. All drilling and support equipment would be contained within the newly constructed drill pad. Temporary non-drilling equipment would include at least one trailer to house the workers (dog house) and additional trailers providing office and operations space.

2.2.3 Completion Operations

Once a well has been drilled, completion operations would begin once crews and equipment are available. Well completion involves setting casing to depth and perforating the casing in target zones. The OCC identified that usable-quality water occurs from the surface to a depth of 750 feet which must be protected. Cimarex proposes to use 9.625" surface casing to case the first 1,000 feet of the well, which meets the OCC and BLM standards and protects all of shallow aquifers. Production casing (5 ½") would be set from the surface to total depth and cemented in all pay zones on both wells. Cementing would meet OCC and BLM regulations.

2.2.4 Stimulation Operations

Hydraulic fracturing would occur through the production casing. The maximum pumping pressure is anticipated to be 5,000 psi at the surface for each well with a maximum proppant fluid weight of 8.0 ppg. The design safety factor for burst is 1.05, which complies with OCC and BLM standards.

Hydraulic fracturing (HF) is one technological key to economic recovery of shale gas. HF is a formation stimulation practice used to create additional permeability in a producing formation, thus allowing gas to flow more readily toward the wellbore. HF can be used to overcome natural barriers, such as

naturally low permeability or reduced permeability resulting from near wellbore damage, to the flow of fluids (gas or water) to the wellbore (GWPC 2009).

HF involves the pumping of fracturing fluid into a formation at a calculated, predetermined rate and pressure to generate fractures or cracks in the target formation. For shale development, fracture fluids are primarily water-based fluids mixed with additives which help the water to carry sand proppant into the fractures. The sand proppant is needed to “prop” open the fractures once the pumping of fluids has stopped. Once the fracture has initiated, additional fluids are pumped into the wellbore to continue the development of the fracture and to carry the proppant deeper into the formation. The additional fluids are needed to maintain the downhole pressure necessary to accommodate the increasing length of opened fracture in the formation.

Before operators or service companies perform a HF treatment, a series of tests is performed. These tests are designed to ensure that the well, well equipment, and HF equipment are in proper working order and will safely withstand the application of the fracture treatment pressures and pump flow rates.

Fracturing fluid make up is described in section 3.10 Wastes—Hazardous and Solid

2.2.5 Production

Production equipment used during the life of one well may include a 3-phase separator-dehydrator; flow-lines; a meter run; tanks for condensate, produced oil, and water; and heater treater. A pump jack may be required if the back pressure of the well is too high. All production facilities would be located on the drill pad. Production facilities would be arranged to facilitate safety and maximize reclamation opportunities. Surface facilities would be set shortly after completion and take about 10 days to set. All permanent above-ground structures would be painted to match the surrounding environment using a solid natural color and surfaces maintained to ensure integrity, as per surface owner agreement.

A secondary containment surrounding the tank batteries would be designed of impervious material to prevent lateral movement of fluids, prior to storage of fluids. The berms that would be constructed would be able to contain a minimum of 150 percent of the storage capacity of the largest tank within the berm.

Workovers may be performed multiple times over the life of the well. Because oil/gas production usually declines over the years, operators perform workover operations which involve cleaning, repairing and maintaining the well for the purposes of increasing or restoring production.

2.2.6 Other

2.2.6.1 Waste Disposal and Hazardous Materials

According to the EPA rule, certain wastes intrinsic to the drilling and production of oil and gas are exempt from regulation as hazardous wastes (USEPA 1988). Although exempted from regulation as hazardous wastes, it is still required that these wastes be disposed of according to applicable rules in an

environmentally acceptable manner. Drilling mud and drill cuttings are included in the exempted waste category.

Drilling mud would constitute the largest volume of solid waste generated by the drilling operation. Cimarex intends to use a closed-loop drilling system in which all fluids and drill cuttings are contained in tanks. The contained fluids and drill cuttings would be transported to an approved, private disposal facility.

During production, produced fluids would be stored in tanks and hauled by truck to an appropriate production (produced oil/condensate) or disposal facility (produced water). Produced natural gas would be transported in an existing pipeline during production.

Limited hazardous wastes (as defined in 40 CFR 355) would be used, produced, stored, transported, or disposed of annually in association with the drilling, testing, and completing of the proposed well. Diesel fuel, sand (silica), hydrochloric acid, and carbon dioxide gas could be potentially stored on site, but at quantities that would not meet the hazardous substance threshold. In addition, natural gas condensate and crude oil, described as hazardous, may be stored or used in reportable quantities. During production operations, triethylene glycol, ethylene glycol mix, and methanol, as described as hazardous substances, may be stored or used on site. Small quantities of retail products (paint/spray paint, solvents [e.g. WD-40], and lubrication oil) containing non-reportable volumes of hazardous substances may be stored and used on site at any time. No extremely hazardous substances, as defined in 40 CFR Part 355, would be used, produced, stored, transported, or disposed of under any of the alternatives.

Trash containers and portable, chemical toilets would be located on well sites during well pad construction, drilling operations, and site restoration. Toilet holding tanks would be pumped as needed and their contents disposed of at a municipal sewage treatment facility in accordance with applicable rules and regulations regarding sewage treatment and disposal. Garbage, trash, and other non-hazardous, solid waste material would be collected in portable self-contained, fully enclosed trash cages and trucked to the nearest landfill for disposal. Trash would not be burned onsite.

As a condition of approval, a Spill Prevention, Contamination, and Countermeasure (SPCC) Plan would be required to be on file, prior to implementing any ground disturbing activities. SPCC is site-specific plan that describes how certain hazardous materials would be managed (oils and fuels), and provides information and procedures in case of a spill or release of those materials occurs.

2.2.6.2 Water

Water would be necessary during all phases of project implementation to keep fugitive dust to a minimum; for personnel "domestic use" (i.e. onsite restrooms, showers, offices, kitchens, etc.); washing tools and equipment, cement; drilling mud; mixing other fluids, and HF. Water would be supplied from a private off-site source. Water would be piped to the site via above ground temporary piping. The above ground piping would be removed once the well is completed and producing. Water for all phases of development would come from the South Canadian River. Cimarex has a contract with the third party to

purchase water from the private source. Cimarex would need to attain all permissions, agreements, and permits prior to using the water.

2.2.6.3 Workforce and Time Requirements

Construction of the access road, drill pad, and production facilities pad would be completed by contractors during daylight hours. Once drilling commences, the operation would become a continuous 24-hour operation until the well is drilled to total projected depth. Rig crews, geologists, and supervisors remain onsite 24 hours per day until drilling is completed. Other personnel would be onsite on a regular basis, but are not considered part of the drilling personnel, including but not limited to health and safety officers, delivery drivers, suppliers, and inspectors.

It is estimated that it would take approximately 45 days for construction of the well pad, access road, and pipeline. Under normal circumstances, drilling would take approximately 15 days. If non-routine circumstances are encountered, drilling time may exceed 30 days per well. HF and the flowback period would likely take 15 days. Cimarex anticipates the entire project from construction to well completion will take between 90 and 120 days of on-site operations. There will likely be stretches where no work would be completed due to availability of rigs and crews.

During production it is estimated that the site would be visited at least a couple of times per week to inspect, read meters, or haul produced oil from the site. Remote telemetry communications would reduce the number of visits needed to read the meters.

2.2.6.4 Reclamation

Interim reclamation of the proposed well pad, access road, and pipeline, would occur immediately after the area is no longer necessary (e.g. after installation, once production equipment is connected). Interim reclamation would include actions as described above.

Final reclamation includes removing surface facilities on location; plugging the well according to Indian, Federal and State requirements; flushing the gas lines, filling with inert gas, sealing the ends, and abandoning the lines in place; and reclaiming all disturbed areas including the well pad, pipeline, and access road once well production ceases. The upgraded access road and road reroute would be left for continued use, while the drill pad and pipeline corridors would be reclaimed.

All disturbed areas would be restored as near as practicable to its preconstruction condition and topography. All surface drainage patterns, which may be affected by the proposed action, would be recontoured and restored to preconstruction conditions. The soil would be ripped and disked or graded, unless otherwise specified by the landowner, to prepare its surface for a seedbed as specified in the landowner agreement or per BIA recommendations. Erosion control techniques would be implemented when/where necessary.

2.2.6.5 Committed Mitigation Measures

Implementation of committed mitigation measures contained in the Surface Use Plan and Drilling Program, standard terms and conditions for Federal oil and gas leases as outlined in the lease purchase

for the affected lease, and the general requirements for oil and gas leases administered by the BLM are incorporated and analyzed in this alternative.

Additionally, Cimarex, in their Surface Use Plan, has committed to.

- Complying with all applicable Federal, State, and local laws and regulations
- Obtaining the necessary permits for the drilling, completion and production of the proposed wells

Following the guidelines outlined in the Gold Book and BMP Handbook (Appendix B—Conditions of Approval)

2.3 Alternatives Considered But Not Analyzed in Detail

The proposed well is the preferred geological target area for each well, and at a surface location acceptable to the BLM, surface owner, surface owner representative, operator, and operator's agent. An alternative to the Proposed Action would be to attempt to relocate the drilling and/or production site BLM, Cimarex personnel determined there are no apparent, known or identified alternative locations which would have less impact, or demonstrate an advantage over the Proposed Action.

As a result, no additional alternatives were considered for further analysis.

3.0 DESCRIPTION OF AFFECTED ENVIRONMENT

This section describes the environment that would be affected by implementation of the alternatives described in Section 2. Aspects of the affected environment described in this section focus on the relevant resources and issues identified for the project area. Certain critical environmental components require analysis under BLM policy. Only those elements of the affected environment that have potential to be impacted are described in detail.

Grady County is in south-central Oklahoma. Adjacent counties are Canadian County on the north, Comanche County on the west, Stephens County on the south, and Garvin County on the east. It has an area of 707,200 acres, or about 1,105 square miles. Elevation in Grady County ranges from 954 to 1,570 feet. The highest point is the Prairie Valley township, and the lowest point is where the Washita River exists in the county.

3.1 Air Resources

Air quality and climate are components of air resources which may be affected by BLM applications, activities, and resource management. Therefore, the BLM must consider and analyze the potential effects of BLM and BLM-authorized activities on air resources as part of the planning and decision making process. Much of the information referenced in this section is incorporated from the Air Resources Technical Report for BLM Oil and Gas Development in New Mexico, Kansas, Oklahoma, and Texas (Air Resources Technical Report) (BLM 2014). This document summarizes the technical information related to air resources and climate change associated with oil and gas development and the methodology and assumptions used for analysis.

3.1.1 Air Quality

The Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality nationwide, including six “criteria” air pollutants. These criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM₁₀ & PM_{2.5}), sulfur dioxide (SO₂) and lead (Pb). EPA has established National Ambient Air Quality Standards (NAAQS) for criteria air pollutants. The NAAQS are protective of human health and the environment. EPA has approved Oklahoma’s State Implementation Plan and the state enforces state and federal air quality regulations on all public and private lands within the state, including tribal lands.

There are three classifications of areas that attain national ambient air quality standards, Class I, Class II and Class III. Congress established certain national parks and wilderness areas as mandatory Class I areas where only a small amount of air quality degradation is allowed. All other areas of the U.S. are designated as Class II, which allow a moderate amount of air quality degradation. No areas of the U.S. have been designated Class III, which would allow more air quality degradation. The primary sources of air pollution are dust from blowing wind on disturbed or exposed soil, exhaust emissions from motorized equipment, oil and gas development, agriculture, and industrial sources. The area of analysis is a Class II airshed. The nearest Class I area (Wichita Mountains) is about 70 miles southwest of the project area. The nearest “non-attainment” area (Dallas-Fort Worth, TX) is over 150 miles south of the

project area (Appendix F)

Current Pollution concentrations

“Design Concentrations” are the concentrations of air pollution at a specific monitoring site that can be compared to the NAAQS. The 2012 design concentrations of criteria pollutants are listed in Table 4. There is no data available, the data is incomplete, or no monitoring was conducted within 100 miles of the project area for lead.

Table 4. 2012 Design Concentrations of Criteria Pollutants (EPA 2013)

Pollutant	Design Value (Tulsa County, OK)*	Averaging period	NAAQS
PM _{2.5}	10.5 µg/m ³	Annual	12.0 µg/m ³ ¹
	22.0 µg/m ³	24-hour	35.0 µg/m ³ ²
PM ₁₀	2.0 exceedances	24-hour	150 µg/m ³ ³
O ₃	0.08 ppm	8-hour	0.075 ppm ⁴
CO	1.2 ppm	8-hour	9 ppm ⁵
	1.8 ppm	1-hour	35 ppm ⁵
NO ₂	9 ppb	Annual	53 ppb ⁵
	No data	1-hour	100 ppb ²
SO ₂	4 ppb	Annual	30 ppb ⁵
	62 ppb	1-hour	75 ppb ⁶
Pb	0.01 µg/m ³		0.15 µg/m ³ ⁷

* Nearest County to proposed parcels with monitoring

+ Incomplete data or no monitoring stations within 100 miles

¹ 3-year average annual mean concentration

² 98th percentile, averaged over 3 years

³ Not to be exceeded more than once per year on average over 3 years

⁴ 3-year average of the annual 4th highest daily maximum 8-hour concentration

⁵ Not to be exceeded more than once per year

⁶ 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years

⁷ Not to be exceeded in any 3-month period

Air quality in a given region can be measured by its Air Quality Index value. The air quality index (AQI) is reported according to a 500-point scale for each of the major criteria air pollutants, with the worst denominator determining the ranking. For example, if an area has a CO value of 132 on a given day and all other pollutants are below 50, the AQI for that day would be 132. The AQI scale breaks down into six categories: good (AQI<50), moderate (50-100), unhealthy for sensitive groups (100-150), unhealthy (>150), very unhealthy and hazardous. The AQI is a national index, the air quality rating and the associated level of health concern is the same everywhere in the country. The AQI is an important indicator for populations sensitive to air quality changes.

Approximately 94 percent of the days in 2013 has a mean AQI value in the good range (AQI<50), while the remaining 6 percent of days were in the moderate range. The median AQI was 36 in Creek County, which is considered “good.” The maximum AQI was 93. In the past, the air quality index in the area annually reached “unhealthy for sensitive groups” on a number of days each year. Over the past decade,

there appears to be a trend toward improved air quality, with fewer “very unhealthy” and “unhealthy” days in the past four years and a downward trend in the total number of “unhealthy for sensitive groups” days in the past decade. Recent years’ improvement in the air quality index may be due to reduced air pollution resulting from local, state and national regulations aimed at reducing ozone and particulate matter concentrations. In 2011 and 2012, the number of days classified as “unhealthy for sensitive groups” can be attributed to natural causes (e.g. wildfires) and should not be looked upon unfavorably in the trend toward improved air quality or a trend toward decreased air quality. This data is shown in Table 5 (EPA 2013b).

Table 5. Number of Days classified as “unhealthy for sensitive groups” or worse (EPA 2015b). Unhealthy for sensitive groups/unhealthy

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Canadian	22	4	4	4	4	24	15	4	0	0

3.1.2 Climate

Oklahoma’s climate ranges from humid subtropical in the east to semi-arid in the west. Warm, moist air moving northward from the Gulf of Mexico often exerts much influence, particularly over the southern and eastern portions of the state, where humidity, cloudiness and precipitation are resultantly greater than in the western and northern sections. Summers are long and usually quite hot. Winters are short and less severe than those of the more northern Plains states. Periods of extreme cold are infrequent, and those lasting more than a few days are rare.

Table 6. Summary of climate components that could affect air quality in the region.

Climate Component	Grady County
Average annual temperature	61°F
Average Max Temperature (annual)	74°F
Average minimum temperature (annual)	49°F
Total annual precipitation	34.94 inches
Total annual snowfall	6.1 inches
Mean annual wind speed	8 mph
Prevailing Wind Direction	Southwest

In addition to the air quality information in the Oklahoma RMP, new information about greenhouse gases (GHGs) and their effects on national and global climate conditions has emerged since the RMP was prepared. Global mean surface temperatures have increased nearly 0.8°C (1.4°F) from 1880 to 2012 (Goddard Institute for Space Studies, 2013). However, observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Without additional meteorological monitoring and modeling systems, it is difficult to determine the spatial and temporal

variability and change of climatic conditions, what is known is that increasing concentrations of GHGs are likely to accelerate the rate of climate change

GHGs that are included in the US GHG Inventory are: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). CO₂ and CH₄ are typically emitted from combustion activities or are directly emitted into the atmosphere. On-going scientific research has identified the potential impacts of GHG emissions (including CO₂, CH₄, N₂O; and several trace gases) on global climate. Through complex interactions on regional and global scales, these GHG emissions cause a net warming effect of the atmosphere (which make surface temperatures suitable for life on Earth), primarily by decreasing the amount of heat energy radiated by the Earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), recent industrialization and burning of fossil carbon sources have caused CO₂ concentrations to increase dramatically, and are likely to contribute to overall climatic changes. Increasing CO₂ concentrations may also lead to preferential fertilization and growth of specific plant species.

In 2007, the Intergovernmental Panel on Climate Change (IPCC) predicted that by the year 2100, global average surface temperatures would increase 1.4°C to 5.8°C (2.5°F to 10.4°F) above 1990 levels. The National Academy of Sciences (2006) supports these predictions, but has acknowledged that there are uncertainties regarding how climate change may affect different regions. Computer model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and increase in daily minimum temperatures are more likely than increases in daily maximum temperatures. It is not, however, possible at this time to predict with any certainty the causal connection of site specific emissions from sources to impacts on the global/regional climate relative to the proposed lease parcel and subsequent actions of oil and gas development.

A 2007 US Government Accountability Office (GAO) Report on Climate Change found that, “federal land and water resources are vulnerable to a wide range of effects from climate change, some of which are already occurring. These effects include, among others: 1) physical effects such as droughts, floods, glacial melting, and sea level rise; 2) biological effects, such as increases in insect and disease infestations, shifts in species distribution, and changes in the timing of natural events, and 3) economic and social effects, such as adverse impacts on tourism, infrastructure, fishing, and other resource uses.”

A number of activities contribute to the phenomenon of climate change, including emissions of GHGs (especially CO₂ and CH₄) from fossil fuel development, large wildfires, activities using combustion engines, changes to the natural carbon cycle, and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs will have a sustained climatic impact over different temporal scales due to their differences in global warming potential (described above) and life span of the atmosphere

3.2 Soils

The varied climate and topography of Oklahoma have combined to produce broad differences in state soils. In the eastern part of the state, soils have been developed where leaching is intense and

conditions are humid. These conditions produce soils low in phosphorous and potassium, while at the same time being moderately to strongly acidic.

The Natural Resource Conservation Service (NRCS) has surveyed the soils in the proposed project area. Sixteen (16) soil types have been identified as occurring in the project area (Table 7).

Table 7. Web soil survey results of soil types found within the proposed parcel.

Map Unit Symbol	Soil Name	Description	Acres in area	% in area
		Well Pad & Access Road	0	
16	Keokuk very fine sandy loam	0-1% slopes; well drained; negligible runoff; loamy and alluvium parent material; more than 80" to water table; moderate to high water storage (about 10.9") water capacity; rare frequency of flooding and no ponding; Prime Farmland	4.02	10
22	McLain silty clay loam	0-1% slopes, moderately well drained; medium runoff; clayey and loamy alluvium; more than 80" to water table; moderate to high water storage (about 10.5") water capacity; rare frequency of flooding and no ponding; Prime Farmland	3.85	9.6
		Pipeline	0	
11	Gracemore loamy fine sand	0-1% slopes; well drained; negligible runoff; calcareous sandy alluvium parent material; more than 80" to water table; low (about 4.4") water capacity; ; frequent of flooding and no ponding; Not Prime Farmland	0.15	0.4
16	Keokuk very fine sandy loam	0-1% slopes; well drained; negligible runoff; loamy and alluvium parent material; more than 80" to water table; moderate to high water storage (about 10.9") water capacity; rare frequency of flooding and no ponding; Prime Farmland	0.04	0.1
59	Goodnight loamy fine sand	5-15% slopes; excessively drained; very low runoff; eolian sands; more than 80" to water table; low (about 4.3") water capacity; no flooding or ponding; Not Prime Farmland	0.08	0.2
62	Yahola fine sandy loam	0-1% slopes; well drained; Negligible runoff; calcareous loamy alluvium; more than 80" to water table; high (about 10.2") water capacity; rare frequency of flooding and no ponding; Prime Farmland	0.46	1.1
Ca	Canadian fine sandy loam	0-1% slopes; well drained; negligible runoff; loamy alluvium parent material; more than 80" to water table; moderate (about 8.3") water capacity; ; rare frequency of flooding and no ponding; Prime Farmland	1.50	3.7
Da	Dale silt loam	0-1 % slopes; well drained; negligible runoff; loamy alluvium; more than 80" to water table; high (about 10.8") water capacity; rare frequency of flooding and no ponding; Prime Farmland	7.93	19.8
Ga	Gracemore loamy fine sand	0-1% slopes; well drained; negligible runoff; calcareous sandy alluvium parent material; more than 80" to water table; low (about 4.4") water capacity; ; occasional flooding and no ponding; Not Prime Farmland	0.88	2.2
Gb	Gracemore soils	0-1% slopes; well drained; negligible runoff; calcareous sandy alluvium parent material; more than 80" to water table; low (about 4.4") water capacity; ; frequent flooding and no ponding; Not Prime Farmland	1.68	4.2

Map Unit Symbol	Soil Name	Description	Acres in area	% in area
Mc	McLain silty clay loam	0-1% slopes, well drained; negligible runoff, loamy and alluvium parent material, more than 80" to water table, moderate to high water storage (about 10.9") water capacity; rare frequency of flooding and no ponding; Prime Farmland	4.18	10.4
MsB	Minco silt loam	1-3% slopes; well drained, low runoff; loamy alluvium and/or eolian deposits, more than 80" to water table, high (about 11.3") water capacity, no flooding or ponding; Prime Farmland	1.24	3.1
MsC	Minco silt loam	3-5% slopes, well drained, low runoff, loamy alluvium and/or eolian deposits; more than 80" to water table, high (about 11.3") water capacity; no flooding or ponding; Prime Farmland	6.71	16.7
NrB	Norge silt loam	1-3% slopes, well drained, low runoff; loamy alluvium, more than 80" to water table, high (about 11.6") water capacity, no flooding or ponding; Prime Farmland	1.16	2.9
Po	Port silt loam	0-1% slopes; well drained; negligible runoff, calcareous loamy alluvium, more than 80" to water table, high (about 12") water capacity; no flooding or ponding; Prime Farmland	1.6	4.0
Tv	Goodnight fine sand	15-30% slopes; excessively drained, low runoff, eolian sands, more than 80" to water table; low (about 3.9") water capacity, no flooding or ponding; Not Prime Farmland	0.24	0.6
Wa	Watonga silty clay	0-1% slopes, moderately well drained, high runoff; calcareous clayey alluvium, more than 80" to water table; high (about 9.6") water capacity; no flooding or ponding; Prime Farmland	4.29	10.7
W	Water		0	0.3
Totals.			40.01	100

The Wind Erodibility Group has been determined for all soil types. The rating scale is based on a 1 to 8 rating with 1 being the most susceptible to wind erosion and 8 being the least susceptible. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion. For the wind erosion susceptibility see Table 8 below.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised USLE to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69, with higher values indicating the soil is more susceptible to sheet and rill erosion by water. For the water erosion susceptibility see Table 8 below.

Table 8. Soil erosion susceptibility within the proposed project area.

Map Unit Symbol	Soil Name	Water Erosion factor (K)	Susceptibility To Water	Wind Erosion Rating	Susceptibility To Wind
16	Keokuk very fine sandy loam	0.37	Moderate	3	Moderate to High
22	McLain silty clay loam	0.37	Moderate	6	Moderate to Low
11	Gracemore loamy fine sand	0.2	Lower	2	High
59	Goodnight loamy fine sand	0.17	Lower	2	High
62	Yahola fine sandy loam	0.2	Lower	3	Moderate to High
Ca	Canadian fine sandy loam	0.24	Lower	3	Moderate to High
Da	Dale silt loam	0.37	Moderate	6	Moderate to Low
Ga	Gracemore loamy fine sand	0.2	Lower	2	High
Gb	Gracemore soils	0.2	Lower	2	High
Mc	McLain silty clay loam	0.37	Moderate	6	Moderate to Low

Map Unit Symbol	Soil Name	Water Erosion factor (K)	Susceptibility To Water	Wind Erosion Rating	Susceptibility To Wind
MsB	Minco silt loam	0.43	Moderate	5	Moderate to Low
MsC	Minco silt loam	0.43	Moderate	5	Moderate to Low
NrB	Norge silt loam	0.37	Moderate	6	Moderate to Low
Po	Port silt loam	0.43	Moderate	5	Moderate to Low
Tv	Goodnight fine sand	0.05	Low	1	High
Wa	Watonga silty clay	0.24	Lower	4	Moderate

3.2.1 Farmlands, Prime or Unique

The Farmland Protection Policy Act (FPPA), Public Law 97-98, as amended, directs Federal agencies to identify and take into account the adverse effects of Federal programs on the preservation of farmland. The FPPA is intended to minimize the extent Federal programs have on the conversion of farmland to nonagricultural uses. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, oilseed crops, and is also available for these uses. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. Unique farmland is land other than prime farmland that is used for the production of specific high value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop.

Table 9. Prime Farmland Soils within proposed project area.

Map Unit Symbol	Soil Name	Acres in area	% in area
16	Keokuk very fine sandy loam	4.06	10.1
22	McLain silty clay loam	3.85	9.6
62	Yahola fine sandy loam	0.46	1.1
Ca	Canadian fine sandy loam	1.5	3.7
Da	Dale silt loam	7.93	19.8
Mc	McLain silty clay loam	4.18	10.4
MsB	Minco silt loam	1.24	3.1
MsC	Minco silt loam	6.71	16.7
NrB	Norge silt loam	1.16	2.9
Po	Port silt loam	1.6	4.0
Wa	Watonga silty clay	4.29	10.7
Totals		36.98	92.1

The NRCS Web Soil Survey and Soils Data system identified Table. 9, "All areas are prime farmland " These soil types make up approximately 36 98 acres (92.1%) of the proposed project area. The remaining acres are identified as "not prime farmland".

3.3 Water Resources

Water is an essential part of energy production. Water is used in exploration, drilling, stimulation (including HF), and enhanced recovery process. While the oil and gas industry uses both surface and groundwater for exploration and production activities, groundwater is used more frequently.

The well site is in the Central Watershed Planning Region, which includes nine basins. The region encompasses 10,142 square miles in central Oklahoma, spanning from southern Woods County to Hughes and Pontotoc Counties in the southeastern portion of the region and including all or portions of Alfalfa, Woodward, Garfield, Major, Kingfisher, Logan, Blaine, Dewey, Creek, Lincoln, Okmulgee, Canadian, Oklahoma, Okfuskee, Caddo, Seminole, Pottawatomie, Grady, Cleveland, McClain, and Garvin Counties.

The proposed project falls within Basin 58 of the Central Watershed Planning Region. Municipal and Industrial water usage makes up approximately 51 % of the basin water demand, excluding out of basin transfers. Crop Irrigation is the second largest water use sector at 21 %. Thermoelectric power accounts for 19% of demand in the basin, Oil & Gas water use sector accounts for 5%, and Livestock water use sector accounts for 3 percent demand in the basin. The remaining one percent is used by the self-supplied residential water use sector. Surface water satisfies about 70 % of the current demand in the basin, while groundwater satisfies about 30 percent of the current demand (19% alluvial and 11% bedrock) (OWRB 2012).

The proposed well site is not in any specially designated surface water protection areas. However, the area is in an Oil and Gas—Special Requirement Area, which is set by the Oklahoma Water Quality Standards (OWQS) for the protection of water quality. The Oil and Gas Production Special Requirement Areas, enacted to protect groundwater and/or surface water, can consist of specially lined drilling mud pits or tanks whose contents are removed upon completion of drilling activities; well set-back distances from streams and lakes; restrictions on fluids and chemicals; or other related protective measures.

3.3.1 Surface water

Oklahoma has abundant surface water resources include rivers, streams, and man-made and natural reservoirs. Oklahoma has two major river basins—the Red River and Arkansas River basins. Precipitation

is the source of virtually all surface water in Oklahoma. The entire state is drained by the Arkansas and Red Rivers and their tributaries. A large number of reservoirs, lakes, and ponds have been constructed on rivers and streams for flood control and to provide a dependable supply of surface water for municipalities, irrigation, recreation, and generation of electricity. About 80 percent of all water used by municipalities and industries is taken from surface water sources. Each year, approximately 10.5 million acre-feet of water flows into Oklahoma through its two major river basins, while an average of 36 million acre-feet flows out of the state each year.

The Canadian River is the longest tributary of the Arkansas River; it is about 906 miles long and drains approximately 47,700 square miles. The project area is in the Canadian River watershed with the river draining the northern portion of the county. The Canadian River typically has an average flow rate of 9,000 acre/feet a month; and a 25,000 acre/feet a month during the spring and early summer. There are no major reservoirs in Basin 58 (OWRB 2012).

Typically, after heavy rains, streams flow strongly and are laden with suspended sediment. Streams draining rangelands carry less sediment load than those that are downstream of croplands. Flow stops or nearly stops in the summer, but scattered pools endure and serve as summer refuges for aquatic fauna. Salt or gypsum deposit and leaching produce high mineral concentrations in many streams and rivers. Numerous streams have been channelized and/or impounded resulting in the loss of riparian forest, unnatural flow regimes, entrenchment, bank erosion, substrate alteration, and fauna modification.

The project area is located in cropland. All runoff from the project area is predicted to flow east across cropland into the Canadian River. The Canadian River is approximately 1,000 feet east of the proposed disturbance areas. The Canadian River flows easterly into the Lake Eufaula. None of the water bodies are navigable; however, the named and unnamed drainages may be jurisdictional waters of the U.S.

3.3.2 Groundwater

Groundwater can be found throughout most of the state and is considered one of the states' most valuable resources. Groundwater supplied 18 percent of the state's drinking water. About 14.7% of the state's fresh groundwater withdrawals were for public water supply system uses. Reported domestic groundwater withdrawals in 2000 accounted for 3.3 percent of total withdrawals from the state's aquifers. Irrigation accounted for 74.5 percent of groundwater withdrawal and is the largest single use of freshwater in the state in 2000. Industrial, mining, and power generation accounted for 1.6 percent of groundwater withdrawals in 2000 (EPA 2009).

The Oklahoma Water Resources Board (OWRB) lists twenty-one major aquifers in Oklahoma. There are two types: alluvial and terrace aquifers and bedrock aquifers. Alluvial and terrace aquifers consist of sand and gravel along major rivers, including the North Canadian and Cimarron Rivers. Bedrock aquifers, such as the Central Oklahoma, the Rush Springs, Ogallala, and the Ozark Plateau aquifers, cover large areas of the state and consist of hardened materials ranging from sandstone to limestone and gypsum. Large areas of the state generally contain local, low yield aquifers or do not produce groundwater (EPA 2009).

Freshwater stored in Oklahoma's aquifers results from downward movement of precipitation and surface waters that enter each aquifer at its recharge area. The system is dynamic; aquifers are recharged continually by percolation down to the water table. The rate of ground-water movement in the state's aquifers is highly variable, probably three to one hundred feet per year in most aquifers, and may reach one hundred to one thousand feet (or more) per year, where the rock is highly porous, cavernous, or fractured (EPA 2009)

Long term groundwater level declines have not been as serious in Oklahoma as in surrounding states. Severe drought conditions in recent years are affecting the state's aquifers' ability to recover from earlier and continuing declines. When there is an increase in rainfall water levels in most alluvial aquifers can recover more quickly from declines, than bedrock aquifers. The greatest protection against overuse of groundwater has come from the permit system operated by Oklahoma Water Resources Board to limit withdrawals (EPA 2009)

The proposed project area is over the Canadian River major alluvial aquifer. In Basin 58, majority of the groundwater rights are from the Canadian River aquifer (OWRB 2012). There is an existing water well adjacent to the proposed well pad. Water used for the project would not come from the Canadian River aquifer, it would come from the Canadian River surface water.

3.4 Wetlands, Riparian Areas

For administrative purposes, the 100-year floodplain serves as the basis for floodplain management for Federal actions. These are in general relatively narrow areas along natural drainage ways that carry large quantities of runoff following periods of high precipitation.

Approximately 86% of the proposed project is within a mapped floodplain due to the proximity to the Canadian River and flat topography.

Wetland habitats provide important wintering and migration habitat for several species of Migratory Birds. Wetlands also provide a link between land and water and are some of the most productive ecosystems in the world. Executive Order (EO) 11990 on the Protection of Wetlands provides opportunity for early review of Federal agency plans regarding new construction in wetland areas. Under EO 11990, each agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for conduction federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating and licensing activities.

A wetland and waterway survey was performed for the proposed project area in order to determine the effect, if any, on aquatic resources. The method used in the BE to determine if an area is a wetland has been described in Section D of the USACE Wetlands Delineation Manual. Generally, in order to be classified as a wetland an area being observed must satisfy three criteria: hydrophytic vegetation, hydric soils, and wetland hydrology.

The composition of the dominant vegetation found within the boundaries of the project area is <50% facultative. This does not satisfy the hydrophytic vegetation condition necessary to indicate a wetland.

The Natural Resources Conservation Service Web Soil Survey (NRCS) and the NRCS Soil Survey for Grady County, Oklahoma, was used to determine the soils present in the proposed project area. The proposed project area overlays a series of well drained soils. During the on-site inspection no hydric soil indicators were observed.

The project area does not contain drift lines and does not foster water-impounding topography. There are no indicators the project area contains wetland hydrology.

3.5 Heritage Resources

3.5.1 Cultural Resources

Open Range Archaeology completed an archival records search on November 14, 2016. Archival research utilizing the online the USGS map server <http://eros.usgs.gov/> and the Bureau of Land Management General Land Office Records <http://www.glorerecords.blm.gov/>, and information contained within professional archaeological reports located at the Oklahoma Archaeological survey.

Archival research determined there were no previously recorded archaeological sites located within one mile of the APE. Examination of historic-period maps and aerial photographs of the APE did not indicate the potential for encountering historic-period (19th and 20th century) cultural resources. There no known 1872 GLO structures were located within one mile. There are no NRHP or eligible properties within one mile of the APE.

To comply with Section 106 of the National Historic Preservation Act, as amended, Open Range Archaeology conducted an on-the-ground cultural resources survey. The study covered an area of 101.63 acres for the proposed well pad, access road, and pipeline. No prehistoric or historic sites and no standing structures were located or recorded within the Area of Potential Effect. Additionally, no fossils were located and no further research is warranted (CRR# NM-040-2017-18).

3.5.2 American Indian Religious Concerns

Traditional Cultural Properties (TCPs) are places that have cultural values that transcend the values of scientific importance that are normally ascribed to cultural resources such as archaeological sites. Native American communities are most likely to identify TCPs, although TCPs are not restricted to those associations. Some TCPs are well known, while others may only be known to a small group of traditional practitioners, or otherwise only vaguely known.

There are several pieces of legislation or Executive Orders that should be considered when evaluating Native American religious concerns. These govern the protection, access and use of sacred sites, possession of sacred items, protection and treatment of human remains, and the protection of archaeological resources ascribed with religious or historic importance. These include the following:

- The American Indian Religious Freedom Act of 1978 (AIRFA; 42 USC 1996, P.L. 95-431 Stat. 469).
- Executive Order 13007 (24 May 1996).

- The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA; 25 USC 3001, P L 101-601).
- The Archaeological Resources Protection Act of 1979 (ARPA; 16 USC 470, Public Law 96-95).
- Memorandum of Understanding Among the U.S. Department of Defense, U.S. Department of the Interior, U.S. Department of Agriculture, U.S. Department of Energy, and the Advisory Council on Historic Preservation Regarding Interagency Coordination and Collaboration for the Protection of Indian Sacred Sites.

As described above, approximately 101.63 acres have been inventoried for cultural resources for the proposed access road, drill pad, and pipeline construction. The proposed action would result in short-term and long-term change and altered utilization of the site and immediate surrounding area.

For the Proposed Action, identification of TCPs were limited to reviewing existing published and unpublished literature, and BLM tribal consultation efforts specific to this proposed action with the Apache Tribe of Oklahoma, Cheyenne and Arapaho Tribes, Chickasaw Nation, Comanche Nation, Muscogee (Creek) Nation, Fort Sill Apache, Kiowa Tribe, the Osage Nation, Seminole Nation, and Wichita and Affiliated Tribes. No TCPs are known to exist within the APE.

3.5.2 Paleontology

Approximately 101.63 acres have been inventoried for cultural and paleontological resources for the proposed access road, drill pad, and pipeline construction. No paleontological resources have been identified within the proposed project area. The proposed action would result in short-term and long-term change and altered utilization of the site and immediate surrounding area. Paleontological Resources are of scientific interest and may require protection. The management of paleontological resources is directed under the Federal Land Policy and Management Act (FLPMA) and the National Environmental Policy Act (NEPA). The Federal Land Management and Policy Act of 1997 (FLMPA) states that it is the policy of the United States that the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values. Paleontological resources are natural resources with scientific value under FLPMA. NEPA mandates that federal agencies prepare a detailed statement of "major federal actions significantly affecting the quality of the human environment."

The new authority for the management, preservation, and protection of paleontological resources on public lands, including Department of the Interior Agencies is the Paleontological Resources Preservation subtitle of the Omnibus Public Land Management Act of 2009 (16 USC 470aaa et seq.), also known by its popular name, the Paleontological Resources Preservation Act (PRPA). In accordance with the PRPA, paleontological resources on Federal land must be managed and protected using scientific principles and expertise.

3.6 Invasive, Non-native Species

Noxious weeds can have a disastrous impact on biodiversity and natural ecosystems. Noxious weeds affect native plant species by out-competing native vegetation for light, water and soil nutrients. Noxious weeds cause \$2 to \$3 million in estimated losses to producers annually. These losses are attributed to: (1) decreased quality of agricultural products due to high levels of competition from noxious weeds; (2) decreased quantity of agricultural products due to noxious weed infestations; and (3) costs to control and/or prevent the spread of noxious weeds.

The State of Oklahoma has listed three noxious weeds and has them as a public nuisance in all counties across the state and mandates that they be treated, controlled, and eradicated. The Early Detection & Distribution Mapping System (2013) at the University of Georgia has identified 27 species in Grady County as being exotic to the US and listed as a problem somewhere in the US. The three state listed species are not identified by EDDMS as occurring in the county. None of the nationally listed invasive species are known to occur in Oklahoma.

Species	Description	Documented in County	Suitable Habitat
Musk thistle <i>Carduus nutans</i>	Found on all types of land except BIA 3 deserts, dense forests, high mountains, coastal areas, and newly cultivated fields. It is most often described as occurring on disturbed sites and waste areas, and along roads.	Yes	Yes
Canada thistle <i>Cirsium arvense</i>	Most common in open, mesophytic areas and grows in a wide variety of soils, including sand dunes, but is most abundant in clayey soils. Disturbance is necessary for initial establishment, but once established it can rapidly spread by both rhizomes and seeds.	No	Yes
Scotch thistle <i>Onopordum acanthium</i>	Prefers habitats with dry summers, growing best in sandy, sandy clay and calcareous soils which are rich in ammonium salts. It grows in newly disturbed places, such as wildfire burn scars, avalanche areas, flood zones, as well as dry pastures and disturbed fields. It prefers disturbed sites with fertile soils, agricultural areas range/grasslands, riparian zones, scrub/shrublands valleys and plains along with water courses.	No	Yes

Suitable habitat, in the form of disturbed sites, roadsides, fields, and agricultural areas, occurs within the existing landscape, as well, the proposed disturbance would create additional suitable habitat. None of the species were identified during the onsite inspection; however, that does not mean they do not exist at all in the surrounding area.

3.7 Vegetation

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. A Roman numeral hierarchical scheme has been adopted for different levels of ecological regions. Level I is the coarsest level, dividing North American into 15 ecological regions. Level II divided the continent into 52 regions. At level III, the continental U.S. contains 104 regions whereas the conterminous U.S. has 48. Level IV ecoregions are further subdivisions of level III

ecoregions In Oklahoma, there are 12 level III ecoregions and 46 level IV ecoregions with most continuing into ecologically similar parts of adjacent states.

In Oklahoma, ecological diversity is strongly related to varied climates, terrain, geology, soil, and land uses. Forests cover most of the Ozark Plateau and the Ouachita Mountains, they become progressively more stunted and open westward. Southern pine forests, typical of Gulf Coastal Plains, occur in the southeast. Tall grass prairie, mixed grass prairie, and short grass prairie are native to central and western Oklahoma. Mesquite and other xeric plants characterize the dry southwest Much of Oklahoma's natural vegetation has been lost to overgrazing, burning, fire suppression, logging, erosion, introduced grasses and forbs, cultivation, and expansion of invasive species such as the eastern redcedar. Today, the state is a mosaic of grazing land, cropland, woodland, forest, and abandoned farmland. Wheat and alfalfa are the main crops. Grain sorghum is well adapted to sandy soils. Soybeans are becoming increasingly common on eastern plains and on moister parts of the prairie Cotton is now concentrated on irrigated farmland in the southwest. Corn, once a major Oklahoma crops, has declined in importance due to soil depletion and periodic droughts.

All of the proposed disturbance area is within a managed pasture and cultivated wheat fields. (Appendix A--Figure 4). The surrounding vegetation is consistent with the modified vegetation as a result of agricultural use and energy development. The proposed projects are located in the Prairie Tablelands ecoregion (EPA 27d) (Appendix A--Figure 3. Ecoregions), which is part of the larger Central Great Plains level III ecoregion. The upland natural vegetation in the dry-subhumid ecoregion is mostly mixed grass prairie, but mesquite-buffalograss and shinnery oak are native, to the south and to sand areas, respectively. The eastern boundary of Ecoregion 27 coincides with the eastern limit of America's winter wheat belt. Cropland is extensive; main crops are wheat, alfalfa, and grain sorghum. Rangelands and grasslands are found in more rugged areas and are being invaded by eastern redcedar.

The Prairie Tableland (27d) ecoregion is nearly level, dominated by cropland, and underlain by Permian red shale, soft sandstone, and siltstone. Natural vegetation is mixed grass prairie, it is distinct from the sand-sagebrush-bluestem prairie of Ecoregion 27l. Ecoregion 27d has greater natural vegetation density, less rainfall variability, less evaporation, and receives more precipitation than Ecoregions 27h and 27m. Rainfall is generally sufficient for small grains. This is the wheat belt of Oklahoma; deep, fertile soils are used to produce winter wheat, grain sorghum, alfalfa, and in the east where rainfall is greatest, soybeans. Ecoregion 27d is as flat as the Red River Tablelands (27m), but grows fewer row crops Land use and terrain are distinct from neighboring Ecoregions 27n, 27o, 27q, 28a, and 29 Soils are not as sandy as Ecoregions 29b, 29c, or 29h. Broad, shallow, low gradient channels with silty bottoms are common They often go dry during the late summer and autumn. At other times, turbid water over one meter deep may occur in larger streams. Uncommon, short stream reaches with gravel, cobble, or bedrock substrates support a few darter species, freckled madtoms, and suckermouth minnows Most wildlife is confined to the borders of streams

Mixed grass prairies have a diverse species composition; however, more plant communities are dominated by little bluestem (*Schizachyrium scoparium*) and sideoats grama (*Boutelous curtipendula*). Mixed grass prairie plant associations include little bluestem/Indiangrass (*Sorghastrum nutans*), little

bluestem/sideoats grama/blue grama (*B. gracilis*), little bluestem/big bluestem, and little bluestem/hairy grama (*B. hirsuta*). Silver bluestem (*Bothriochloa saccharoides*) and prairie threeawn (*Aristida oligantha*) occur in disturbed sites. Other common grasses and forbs include sneezeweed (*Helenium ananum*), hairy sunflower (*Helianthus hirsutus*), heath aster (*Aster ericoides*), roundlead bladderpod (*Lesquerella ovalifolia*), purple coneflower (*Echinacea angustifolia*), leadplant (*Amorpha canescens*), panic grass (*Dichanthelium oligosanthos*), and foxtail barley (*Hordeum jubatum*).

All of the proposed disturbance area is in cropland that is also highly influenced by farming use. The surrounding vegetation is consistent with the modified, fragmented vegetation as a result of farming, urban development, recreational use, livestock use and energy development.

3.8 Wildlife

3.8.1 Threatened and Endangered Species

In accordance with the Endangered Species Act of 1973, Federally-listed threatened and endangered species were identified for the proposed project area Consultation Code: 02EKOK00-2017-SLI-0392 Dated: November 16, 2016, Event Code: 02EKOK00-2017-E-00419. These species have the potential to be present in or migrate through Grady County, Oklahoma.

Federally-listed endangered, threatened, proposed, and candidate species for this project area located in Grady County, Oklahoma consist of the Piping plover (*Charadrius melodus*), Least tern (*Sterna antillarum*), Red knot (*Calidris canutus rufa*), Arkansas River shiner (*Notropis girardi*) and the Whooping crane (*Grus americana*).

3.8.2 Special Status Species

The group of species referred to as Special Status Species includes state listed threatened or endangered plant or animal species under the Oklahoma Department of Wildlife Conservation. The Oklahoma Department of Wildlife Conservation has not listed any species for Grady County. Furthermore, a review by The Oklahoma Natural Heritage Inventory database had no records of occurrences for any threatened, endangered, or special status species within a 1-mile radius of the proposed project area.

3.8.3 Migratory Birds

Executive Order (EO) 13186, 66 Fed. Reg. 3853, (January 17, 2001) identifies the responsibility of federal agencies to protect migratory birds and their habitats, and directs executive departments and agencies to undertake actions that will further implement the Migratory Bird Treaty Act (MBTA). Under the MBTA, incidental, unintentional, and accidental take, killing, or possession of a migratory bird or its parts, nests, eggs or products, manufactured or not, without a permit is unlawful. The MBTA has no provisions for a permitting process which allows for regulated "take" of migratory birds. EO 13186 includes a directive for federal agencies to develop a memorandum of understanding (MOU) with the Service to promote the conservation of migratory bird populations, including their habitats, when their actions have, or are likely to have, a measurable negative effect on migratory bird populations.

For the purpose of this BE, the term “migratory birds” applies generally to native bird species protected by the Migratory Bird Treaty Act (MBTA). This includes native passerines (flycatchers and songbirds) as well as birds of prey, migratory waterbirds (waterfowl, wading birds, and shorebirds), and other species such as doves, hummingbirds, swifts, and woodpeckers. The term “migratory” is a misnomer and should be interpreted broadly to include native species that remain in the same area throughout the year as well as species that exhibit patterns of latitudinal or elevational migration to avoid winter conditions of cold or a shortage of food. For most migrant and native resident species, nesting habitat is of special importance because it is critical for supporting reproduction in terms of both nesting sites and food. Also, because birds are generally territorial during the nesting season, their ability to access and utilize sufficient food is limited by the quality of the territory occupied. During non-breeding seasons, birds are generally non-territorial and able to feed across a larger area and wider range of habitats.

Among the wide variety of species protected by the MBTA, special concern is usually given to the following groups:

- Species that migrate across long distances, particularly Neotropical migrant passerines that winter in tropical or Southern Hemisphere temperate zones.
- Birds of prey, which require large areas of suitable habitat for finding sufficient prey.
- Species that have narrow habitat tolerances and hence are vulnerable to extirpation from an area as a result of a relatively minor habitat loss.
- Species that nest colonially and hence are vulnerable to extirpation from an area and hence are vulnerable to extirpation from an area as a result of minor habitat loss

Because of the many species that fall within one or more of these groups, BLM focuses on species identified by Service as Birds of Conservation Concern (BCC). Twenty-seven Birds of Conservation Concern are listed for the Central Mixed-Grass Prairie (Bird Conservation Region 19) BCC 2008 list, where this project occurs, the lesser prairie-chicken, little blue heron, Mississippi kite, Bald Eagle, Swainson's hawk, black rail, snowy plover, mountain plover, solitary sandpiper, upland sandpiper, long-billed curlew, hudsonian godwit, marbled godwit, buff-breasted sandpiper, short-billed dowitcher, red-headed woodpecker, scissor-tailed flycatcher, loggerhead shrike, Bell's vireo, Sprague's pipit, Cassin's sparrow, lark bunting, Henslow's sparrow, Harris's sparrow, McCown's longspur, Smith's longspur and the chestnut-collared longspur. The North American Breeding Bird Survey Results and Analysis 1966-2010, breeding bird surveys conducted near the site the (Verden Route) found eight species from the BCR 19 list that are known to nest in or near the proposed project area, the little blue heron, Mississippi kite, Swainson's hawk, red-headed woodpecker, scissor-tailed flycatcher, Bell's vireo, loggerhead shrike and the upland sandpiper.

3.8.4 Wildlife

Wildlife includes all non-domesticated plants, animals and other organisms. Several species may inhabit the project area, such as, dove, turkey, deer, rabbit, squirrels, raccoons, and coyotes. Additionally, many

species of songbirds may utilize the project area. Due to this project area located on privately owned surface, comprehensive biological inventories are not available.

3.9 Wastes – Hazardous or Solid

BLM Instruction Memorandum WO-93-344 require that all NEPA documents list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported, or disposed of as a result of a proposed project. Many industry practices for use of materials commonly used for oil and gas projects are dictated by various Federal and State laws and regulations, and the BLM standard lease terms and stipulations that would accompany any authorization resulting from this analysis. The most pertinent of the Federal laws dealing with hazardous material contamination are as follows:

- The Oil Pollution Act (Public Law 101-380, August 18, 1990) prohibits discharge of pollutants into waters of the U.S., which by definition includes any perennial stream or any tributary stream, including ephemeral drainage that conveys water to a perennial stream.
- The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 (Public Law 96-510) provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment. It also provides national, regional, and local contingency plans.
- The Resource Conservation and Recovery Act (RCRA) (Public Law 94-580, October 21, 1997) regulates the use of hazardous substances and the disposal of hazardous wastes from the time they are produced until their disposal. On January 6, 1988, EPA determined that most oil and gas exploration, development and production wastes would not be regulated as hazardous wastes under RCRA.

Anticipated use or produced hazardous materials during the project may come from drilling materials; cementing and plugging materials; HF materials; production products (natural gas, condensates, produced water); fuels and lubricants; pipeline materials; combustion emissions; and miscellaneous materials. Table 8 includes some of the common wastes (hazardous and non-hazardous) that are produced during oil and gas development.

Table 8. Common wastes produced during oil and gas development.

Phase	Waste
Construction	<ul style="list-style-type: none"> • Domestic wastes (i.e. food scraps, paper, etc.) • Excess construction materials • Used lubricating oils • Solvents • Woody debris • Paints • Sewage
Drilling	<ul style="list-style-type: none"> • Drilling muds, including additives (i.e. chromate and barite) and cuttings

Phase	Waste
	<ul style="list-style-type: none"> Well drilling, completion, workover, and stimulation fluids (i.e. oil derivatives such as polycyclic aromatic hydrocarbons (PAHs), spilled chemicals, suspended and dissolved solids, phenols, cadmium, chromium, copper, lead, mercury, nickel) Equipment, power unit and transport maintenance wastes (i.e. batteries; used filters, lubricants, oil, tires, hoses, hydraulic fluids; paints; solvents) Fuel and chemical storage drums and containers Cementing wastes Production testing wastes Excess construction materials Scrap metal Sewage Rigwash Excess drilling chemicals Processed water Contaminated soil Domestic wastes
HF	See below
Production	<ul style="list-style-type: none"> Power unit and transport maintenance wastes (i.e. batteries; used filters, lubricants, filters, tires, hoses, coolants, antifreeze, paints; solvents, used parts) Discharged produced water Production chemicals Workover wastes (e.g. brines) Tank or pit bottoms Contaminated soil Scrap metal
Abandonment/ Reclamation	<ul style="list-style-type: none"> Construction materials Decommissioned equipment Contaminated soil Insulating materials Sludge

Hydraulic Fracturing

Chemicals serve many functions in HF, from limiting the growth of bacteria to preventing corrosion of the well casing. Chemicals are needed to insure the HF job is effective and efficient. The fracturing fluids used for shale stimulations consist primarily of water but also include a variety of additives. The number of chemical additives used in a typical fracture treatment varies depending on the conditions of the specific well being fractured. A typical fracture treatment will use very low concentrations of between 3 and 12 additive chemicals depending on the characteristics of the water and the shale formation being fractured. Each component serves a specific, engineered purpose. The predominant fluids currently being used for fracture treatments in the shale gas plays are water-based fracturing fluids mixed with friction-reducing additives (called slickwater) (GWPC 2009).

Compound	Purpose	Common application
Acids	Helps dissolve minerals and initiate fracture in rock (pre-fracture)	Swimming pool cleaner
Sodium Chloride	Allows a delayed breakdown of the gel polymer chains	Table salt
Polycarboxylate	Minimizes the friction between fluid and pipe	Water treatment, soil conditioner
Ethylene Glycol	Prevents scale deposits in the pipe	Automotive anti-freeze, deicing agent, household cleaners
Borate Salts	Maintains fluid viscosity as temperature increases	Laundry detergent, hand soap, cosmetics
Sodium/Potassium Carbonate	Maintains effectiveness of other components, such as crosslinkers	Washing soda, detergent, soap, water softener, glass, ceramics
Glycolaldehyde	Eliminates bacteria in the water	Disinfectant, sterilization of medical and dental equipment
Gum Gum	Thickens the water to suspend the sand	Thickener in cosmetics, baked goods, ice cream, toothpaste, sauces
Chitosan	Prevents precipitation of metal oxides	Food additive; food and beverages; lemon juice
Surfactant	Used to increase the viscosity of the fracture fluid	Glass cleaner, antiperspirant, hair coloring

The make-up of fracturing fluid varies from one geologic basin or formation to another. Because the make-up of each fracturing fluid varies to meet the specific needs of each area, there is no one-size-fits-all formula for the volumes for each additive. In classifying fracture fluids and their additives it is important to realize that service companies that provide these additives have developed a number of compounds with similar functional properties to be used for the same purpose in different well environments. The difference between additive formulations may be as small as a change in concentration of a specific compound (GWPC 2009).

Typically, the fracturing fluid consists of about 99 percent water and sand and about 1 percent chemical additives. The chemical additives are essential to the process of releasing gas trapped in shale rock and other deep underground formation. Figure 1 describes the purpose of the compound and its common household application, while figure 2 is an example of what fracturing fluids may look like in the Barnett Shale play.

Some soils and geologic formations contain low levels of radioactive material. This naturally occurring radioactive material (NORM) emits low levels of radiation, to which everyone is exposed on a daily basis. When NORM is associated with oil and natural gas production, it begins as small amounts of uranium and thorium within the rock. These elements, along with some of their decay elements, notably radium₂₂₆ and radium₂₂₈, can be brought to the surface in drill cuttings and produced water. Radon₂₂₂, a gaseous decay element of radium, can come to the surface along with the shale gas. When NORM is brought to the surface, it remains in the rock pieces of the drill cuttings, remains in solution with produced water, or, under certain conditions, precipitates out in scales or sludges. The radiation is weak and cannot penetrate dense materials such as the steel used in pipes and tanks.

3.10 Mineral Resources

Oklahoma's mineral resources include: nonfuel minerals such as limestone, gypsum, salt, clays, iodine, and sand and gravel, coal; and petroleum. In recent years, the mineral industry has been the State's greatest source of revenue. Although Oklahoma's petroleum production accounts for about 95 percent of Oklahoma's annual mineral output, nonfuel minerals and coal represent a significant part of the current economy and an important source of future wealth. Leading commodities produced include crushed stone, Portland cement, construction sand and gravel, industrial sand and gravel, iodine, and Grade A helium (USGS 2011). Other commodities now produced in Oklahoma, or for which there are current mining permits, include clays and shale, salt, lime, granite, rhyolite, dolomite, sandstone, volcanic ash, coal, and Tripoli. Deposits and resource that are not mined now, or with no current mining permits, include asphalt, lead, zinc, copper, iron, manganese, titanium, and uranium

The Federal mineral estate (oil and gas) in Oklahoma totals 1,998,932 acres, with 330,800 (20%) acres currently leased. Most of the state is in a high oil and gas occurrence and development potential category (BLM 1993), including Grady County. In 2011, 531,672 barrels (bbl) of oil were produced in the county and 1,372,079 thousand cubic feet (MCF) of natural gas was produced.

Other commodities in the county include uranium, limestone and dolomite, asphalt, and sand and gravel

3.11 Visual Resources

BLM Manual H-8410-1 lays out the visual resource inventory process for determining visual values. The inventory consists of scenic quality evaluation, sensitivity level analysis, and a delineation of distance zones. The purpose of the analysis is to determine the area's Visual Resource Management Class (VRM), which defines the degree of acceptable visual change within a characteristic landscape on BLM lands. Because this action, is occurring on private surface a VRM class has not been established for the proposed project area.

The existing landscape includes agriculture and oil and gas development visual impacts from cultivated wheat fields, pasture roads, irrigation systems, outbuildings, facilities, lease roads, pipelines, utility lines, and above ground components such as tanks, pumpjacks, wellheads, fences, and signs. Agriculture and oil and gas development and production facilities are readily visible from residences, highways, and country roads in most of the county, including the project area.

The nearest mapped interstate (Interstate 40) is approximately ten (10) miles north of the proposed well site and the nearest mapped state highway (OK 152) is approximately two (2) miles northwest. An extensive network of lease roads, pasture roads and small county roads surround the proposed well site. None of the roads was created or is designated as a scenic byway or highway.

The closest large river (Canadian River) is approximately 1000 feet to the east of the proposed well sites. Several smaller rivers and streams pass near the project area. Each of these water courses are periodically used by recreationists for wildlife watching, hiking, equestrian riding, ATV riding, and

hunting. Recreation to these areas is limited by access. None of the rivers are designated or eligible as a Wild and Scenic River.

3.12 Socioeconomics and Environmental Justice

3.12.1 Socioeconomics

Oklahoma's population is approximately 3.9 million is mostly urban, with almost 70 percent of the State's population residing in cities or towns. Over 90 percent of the State's land is in farms and ranches, the large size of typical Oklahoma farms and modern farming methods have resulted in relatively few people residing in rural areas. Oklahoma has a population density of approximately 54.7 people per square mile.

Oklahoma's economy is based upon a combination of agriculture production, manufacturing, service industries and mineral extraction. Manufacturing contributes \$18.6 billion to Oklahoma's economy and has been the fastest growing industry in the state. The oil and gas industry is a major contributor to the Oklahoma economy bringing in \$15.9 billion through the extraction of more than 13 million barrels of oil and over 54 trillion cubic feet of natural gas (BEA 2012).

Oklahoma employed about 1,735,000 people in 2014, of which approximately 96,500 were jobs related to farming and agriculture (U.S. Census Bureau, 2014 American Community Survey 1-Year Estimates). The largest employer for the State is consistently the government, both state and local. Oklahoma's labor force participation rates have remained relatively constant. The unemployment rate in 2012 hovered around 5.2 percent (BLS 2013).

In 2011, Oklahoma's top commodities had a value of \$5,591 million with cattle and calves contributing to almost half of the value, followed by hogs and pigs, poultry and eggs, winter wheat, hay, corn, soybeans, cotton, peanuts, canola, pecans, grain sorghum, rye, watermelon, sunflowers, and oats, all of which had a production value of over \$1 million.

Grady County's economy has been primarily based on agriculture and the energy business. The principal crops have included cotton, corn, wheat, oats, and Kaffir corn. The petroleum industry has also boosted the economy and is an important source of income for many residents. Manufacturing has played only a minor role in the economy.

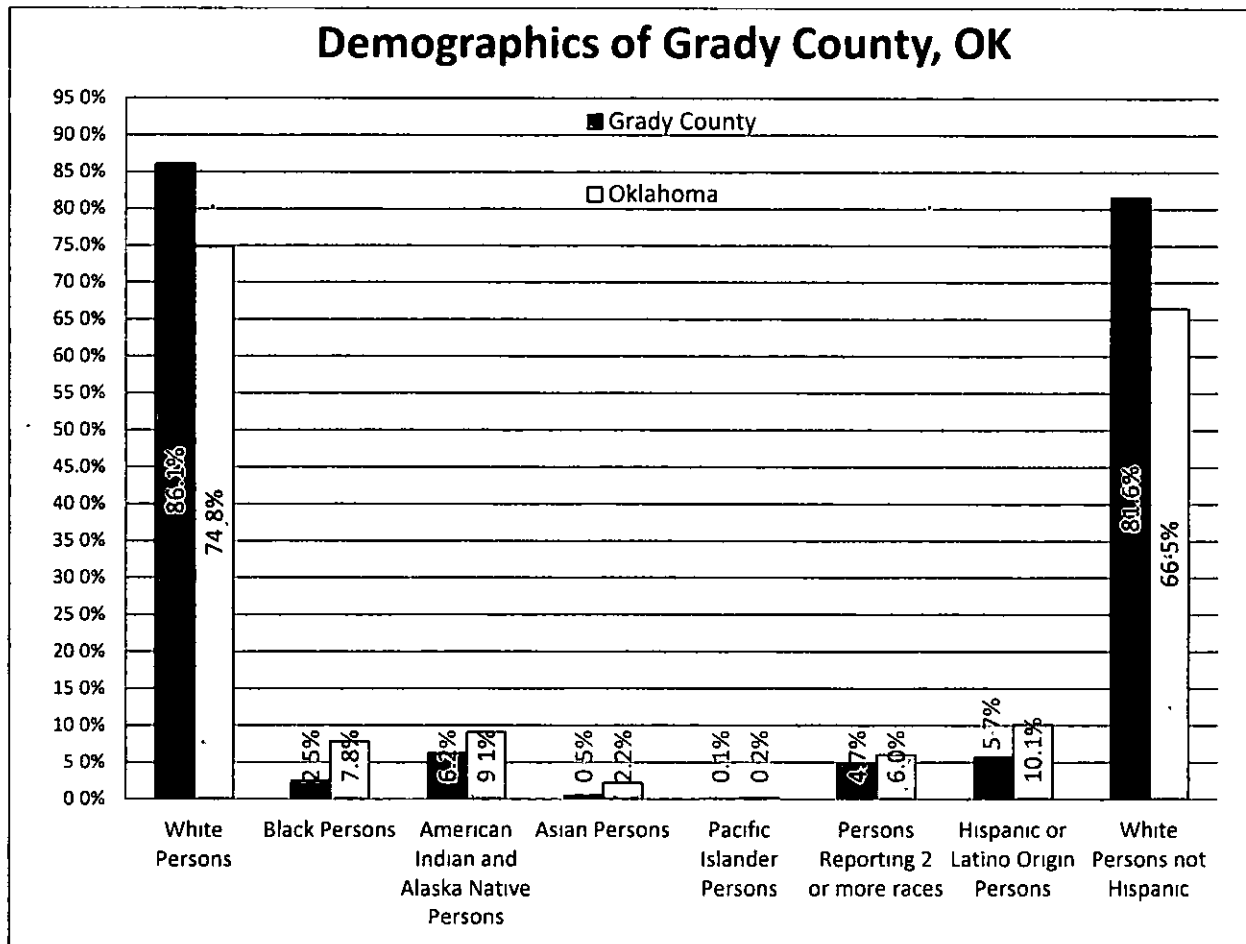
3.12.2 Environmental Justice

Executive Order 12989, issued on 11 February 1994, addresses concerns over disproportionate environmental and human health impacts on minority and low-income populations. The impetus behind environmental justice is to ensure that all communities, including minority, low-income or federally recognized tribes, live in a safe and healthful environment.

In 2015, the estimated population of Grady County was 54,648 people, which makes up approximately 0.01 percent of Oklahoma's total population. The demographics of the county are shown in Figure 2 (2015 Demographics of Grady County and Oklahoma). According to the U.S. Census Bureau, the 2010-

2014 median household income in the County is \$51,394 which is above the state average of \$46,235. Approximately 12.1 percent of the population lives at or below the poverty level, which is lower than the 16.1 percent state-wide average

Figure 2. 2015 Demographics of Grady County and Oklahoma.



4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Effects from the No Action Alternative

There would be no impacts from oil and/or gas construction, drilling and production activities. The No Action Alternative would result in the continuation of the current land and resource uses in the proposed project area. The No Action Alternative is also used as the baseline for comparison of alternatives.

It is an assumption that the No Action Alternative (APD denied) may result in a slight reduction in domestic production of oil and gas. This would likely result in reduced Tribal, allottee, and state royalty income, and the potential for Indian minerals to be drained by wells on adjacent private or state lands. Consumption is driven by a variety of complex interacting factors including energy costs, energy efficiency, availability of other energy sources, economics, demography, and weather or climate. If the BLM were to forego leasing and potential development of those minerals, the assumption is the public's demand for the resource would not be expected to change. Instead, the undeveloped resource would be replaced in the short- and long-term by other sources that may include a combination of imports, using alternative energy sources (e.g. wind, solar) and other domestic production. This displacement of supply would offset any reductions in emissions achieved by not leasing the subject tracts in the short-term.

4.2 Effects of Alternative B—Proposed Action

4.2.1 Air Resources

4.2.1.1 Air Quality

There are a variety of activities that potentially create air emissions during all phases of oil and gas production during oil and gas development. The primary emission sources during construction through completion is in the form of fugitive dust and road and non-road mobile sources; during production the major sources include compressor engine exhausts, oil and condensate tank vents, production well fugitives, well drilling and HF, well completions, natural gas processing, and transmission fugitives.

Construction through Completion Phases

Access road, drill pad, and pipeline construction, site clearing, transportation and movement of personnel and equipment on new and existing dirt roads, and onsite mixing of muds generate fugitive dust and the emission of Particulate Matter (PM). Water would be used to suppress fugitive dust minimizing visual and health impacts from construction and drilling activities. Dust dissemination would be greatly reduced upon completion of the construction and drilling phases of the project. Adding gravel to the well pad and access road would minimize fugitive dust from vehicular traffic during the production phase.

Oil and gas drilling rigs require substantial power to drill to the depths of hydrocarbon deposits and is typically provided by transportable diesel engines, which generates exhaust from the burning diesel fuel. Drilling rig engines may be fueled by either diesel or natural gas.

Operation of heavy equipment during road and pad construction, transportation vehicles, the drill rig and other associated motorized machinery for construction and drilling will result in the emission of fossil fuel combustion exhausts and the release of CO, NO_x, SO₂, Pb, PM, CO₂, CH₄, and N₂O. The actual emissions of each pollutant are entirely dependent on a number of factors and cannot be verified or assumed for the proposed action. Construction and drilling phase emission sources would be short-term lasting 90 to 120 days. Completion of the construction and drilling phases would greatly reduce the exhaust emissions and should have no long-term impacts.

After the wellbore is formed, additional power is needed during HF phase. During HF, multiple diesel-powered pumps burning fossil fuels are used to achieve the necessary pressure to move large quantities of fracturing fluids and cause fractures in the shale formation. After the wellbore is formed and the shale fractured, an initial mixture of gas, hydrocarbon liquids, water, sand, or other materials comes to the surface. Standard practice has been to vent or flare the natural gas during this well completion process and direct sand, water, and other liquids into holding tanks. After the mixture is relatively free of water and sand, the well can be connected to the permanent gas collecting pipes at the well site.

During the completion phase, the most significant emissions of criteria pollutants emitted by oil and gas operations in general are VOCs, particulate matter and NO₂. VOCs and NO_x contribute to the formation of ozone, which is a pollutant of concern in Oklahoma. Data provided to EPA's Natural Gas STAR Program show that some of the largest air emissions in the natural gas industry occur as natural gas wells that have been fractured are being prepared for production. During well completion, "flowback", fracturing fluids, water, and reservoir gas come to the surface at high velocity and volume. This mixture includes a high volume of VOCs and methane, along with air toxics such as benzene, ethylbenzene, and n-hexane. The typical flowback process lasts from three to 10 days.

If venting /flaring of gas is necessary, there would be a substantial loss in CO, CH₄ and VOC/HAPs emissions to the atmosphere and could also release sulfur dioxide if the gas is sour. These emission sources from flaring would be short-term and lasting only as long as necessary to remove unwanted components of the produced natural gas. After those unwanted components are removed, natural gas would be rerouted to the gathering pipelines for transport to a sale pipeline.

Production Phase

Operation of production equipment such as compressors, pumps, separator motors, heater treaters, generators, and boilers may also result in the release of fossil fuel combustion resulting in the formation of NO_x; however, this equipment typically utilize fuel sources produced on site, such that machinery exhausts may contain greater amounts of particulates than from refined fuels. Additional emissions may include products of incomplete combustion. Emissions are anticipated to continue until the site is completely reclaimed.

Crude oil generally contains some fractions that will volatilize at ambient temperatures and pressures. Storage of crude in open tanks or closed tanks with vents as well as the accumulation of waste oil may allow the release of VOCs to the air. Condensate tanks can leak hydrocarbon vapors through vents on the tanks.

Fugitive leaks from pipes, closed tanks, and treatment equipment may contribute to the release of VOCs to the air. Leaks are not uncommon and some leaks can result in large emissions of VOCs and CH₄ to the atmosphere and can be caused by routine wear, rust and corrosion, improper installation or maintenance, or overpressure of the gases or liquids in the piping. In addition to the unintended fugitive emissions, pneumatic valves which operate on pressurized natural gas leak small quantities of natural gas by design during normal operation. Natural gas wells and pipelines, in particular, often contain large numbers of these kinds of pneumatic valves, and the accumulated emissions from all the valves in the system can be significant. Routine inspections of the facilities, pipelines, and associated equipment would minimize the chance for leaks and release of emissions through early detection of issues and the need for repairs. Flaring and release of emissions during the production phase would only be necessary during periodic maintenance and would not last more than a couple of hours every 5-10 years. Minimal periodic flaring would be short in duration and not significantly impact air quality.

VOCs may be emitted during the dehydration of natural gas. VOC emissions are typically lower in natural gas activities than those associated with oil production because gas production is essentially a closed process from well to pipeline with fewer opportunities for emissions.

Visual Quality Related Resources

Visibility impairment as a result of Regional Haze caused by an accumulation of pollutants is not anticipated because of the minimal, localized disturbance. There are no Class I airsheds in or near the project area that could be impacted by the proposed project. Minor air pollution would result from exhaust emissions due to operation of the drill rig itself as well as heavy equipment and large trucks during construction, operation, and reclamation.

Atmospheric deposition occurs when air pollutants are transferred from the air to terrestrial and/or water resources. While deposition can be a significant source of pollutants, it is also typically recognized to result from activities of long duration. In this case, the proposed project is relatively small in size and will take place over a maximum period of 120 days; therefore, it should not have a significant contribution to long-term depositional effects.

The greatest air emissions and impacts on air quality would occur during construction, drilling, and completion. Once these phases are complete, air emissions and impacts are expected to be minor throughout the life of the well. Once the well has been plugged and abandoned and the area reclaimed, air emissions and impacts are expected to return to baseline conditions. Overall, implementation of the proposed project is expected to have minor impacts on air quality but is not expected to impact or contribute to any areas not meeting NAAQS standards.

Mitigation

The BLM encourages industry to incorporate and implement best management practices (BMPs), which are designed to reduce impacts to air quality by reducing emissions, surface disturbances, and dust from field production and operations. Typical measures include: adherence to BLM's Notice to Lessees' (NTL) 4(a) concerning the venting and flaring of gas on Federal leases for natural gas emissions that cannot be economically recovered, flared hydrocarbon gases at high temperatures in order to reduce emissions of incomplete combustion, water dirt roads during periods of high use in order to reduce fugitive dust emissions; collocate wells and production facilities to reduce new surface disturbance; implementation of directional drilling and horizontal completion technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores; require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored; and perform interim reclamation to reclaim areas of the pad not required for production facilities and to reduce the amount of dust from the pads. In addition, the BLM encourages oil and natural gas companies to adopt proven, cost-effective technologies and practices that improve operational efficiency and reduce natural gas emissions.

In October 2012, EPA promulgated air quality regulations for completion of hydraulically fractured gas wells. These rules require air pollution mitigation measures that reduce the emissions of volatile organic compounds during gas well completions. Mitigation includes a process known as "Green Completion" in which natural gas brought up during flowback must be recaptured and reroute into the gathering line.

4.2.1.2 Climate

The two primary GHGs associated with the oil and gas industry are CO₂ and CH₄. During construction and drilling operations, there would be a temporary increase in motorized equipment exhaust emissions. If the well produces, intermittent venting of gas during production operations is likely. As a result, conventional pollutants such as ozone, carbon monoxide, hydrogen sulfide (H₂S), petroleum aromatic hydrocarbons (PAHs), and particulates may be released during the construction, drilling, and production phases of the well.

Methane (CH₄) is the principal component of natural gas and a known GHG. Although the processing of natural gas is essentially confined from the well to sales, CH₄ may be released as a fugitive emission from gas processing equipment, especially equipment in high pressure service such as pneumatic controls. Producers have strong economic incentives to limit fugitive methane emissions to the greatest degree possible in order to maximize delivery of methane to market.

Environmental impacts of GHG emissions from oil and gas refining and from consumption, such as from vehicle operations, are not effects of BLM actions related to oil and gas development as defined by the Council on Environmental Quality (CEQ), and thus are not required to be analyzed under NEPA. GHG emissions from refining and consumption of oil and gas do not constitute a direct effect that is analyzed under NEPA because they do not occur at the same time and place as the action. Nor are refining and consumption an indirect effect of oil and gas production because production is not a proximate cause of GHG emissions resulting from refining and consumption.

The assessment of GHG emissions, their relationship to global climatic patterns, and the resulting impacts is an ongoing scientific process. It is currently not feasible to know with certainty the net impacts from the proposed action on climate—that is, while BLM actions may contribute to the climate change phenomenon, the specific effects of those actions on global climate are speculative given the current state of the science. The BLM does not have the ability to associate a BLM action's contribution to climate change with impacts in any particular area. The science to be able to do so is not yet available. The inconsistency in results of scientific models used to predict climate change at the global scale coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at this level and determining the significance of any discrete amount of GHG emissions is beyond the limits of existing science. When further information on the impacts to climate change is known, such information would be incorporated into the BLM's planning and NEPA documents as appropriate.

Mitigation

The mitigation measures and BMPs implemented to reduce the impacts to air quality would also reduce GHG emissions and minimize the impact of all phases of the proposed project on climate. Operators rely on BMPs (e.g. low-bleed gauges and valves, inspection and maintenance programs, infra-red [IR] cameras, etc.) to reduce any potential methane loss.

The EPA's GHG emissions data describes "Natural Gas Systems" and "Petroleum Systems" as two major categories of US sources of GHG emissions. The inventory identifies the contributions of natural gas and petroleum systems to total CO₂ and CH₄ emissions (natural gas and petroleum systems do not produce noteworthy amounts of any of the other greenhouse gases). Within the larger category of "Natural Gas Systems", the EPA identifies emissions occurring during distinct stages of operation, including field production, processing, transmission and storage, and distribution. "Petroleum Systems" sub-activities include production field operations, crude oil transportation and crude oil refining. Within the two categories, the BLM has authority to regulate only those field production operations that are related to oil and gas measurement, and prevention of water (via leaks, spills and unauthorized flaring and venting).

The EPA data show that improved practices and technology and changing economics have reduced CO₂ emissions from oil and gas exploration and development (Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2010 (EPA 2012)). One of the factors in this improvement is the adoption by industry of the BMPs proposed by the EPA's Natural Gas Energy Star program. The OFO will work with industry to facilitate the use of the relevant BMPs for operations proposed on Federal mineral leases where such mitigation is consistent with agency policy. While EPA data shows that methane emissions increased from oil and gas exploration and development from 1990-2010, reductions in methane emissions from oil and gas exploration and development should occur in future years as a result of EPA's recently finalized oil and gas air emissions regulations.

4.2.2 Soils

Under the proposed action, a maximum 40.01 acres of vegetation would be cleared, topsoil would be stripped, and surface would be altered. Approximately 2.64 acres would remain as bare, relatively flat, compacted surface for the life of the proposed project; the remainder would be recovered with topsoil and reseeded during interim reclamation.

The proposed project would impact Sixteen (16) during all phases of the project. The clearing of vegetation within the proposed project area would result in the exposure of soils to water erosion, wind erosion, and direct human disturbances. Erosion within the proposed project area would potentially increase during the short-term. The hazards and level of erosion susceptibility may vary over the life of the project depending on the project phases. The hazard of erosion would be the highest during the construction phases of the proposed Project. Construction activities would result in the mixing, displacement, and compaction of soils. The degree of erosion would be dependent upon precipitation and wind. Following construction, the compaction of soils, reclamation of portions of the proposed project area, and implementation of erosion-control measures would limit soil impacts due to erosion. These BMPs include, but are not limited to, salvage and stockpiling of topsoil, recontouring and reseeding of areas not used on a regular basis; replacement of the sub-surface soils and topsoil in the proper order; incorporating mulched vegetation into topsoil; and construction of waterbars.

Implementing BMPs, such as dust suppression, should minimize soil movement onto adjacent lands and into drainages during the construction and drilling phases. Adding crushed limestone to the well pad and access road and completion of interim and final reclamation measures would reduce additional long-term soil disturbance and loss. Timely and successful reestablishment of vegetation on portions of the pipeline and access roads would reduce and potentially eliminate any further long-term, residual impacts to soil. It is expected that following revegetation and two to three growing seasons, soil impacts would drop to near baseline conditions from final reclamation efforts.

Topsoil and several inches of subsoil would be removed to construct the well pad and access road. Removed topsoil and subsoil would be stockpiled separately for use during interim and final reclamation. During removal, there is a chance that the segregation and reapplication of surface soils could result in the mixing of shallow soil horizons, resulting in the blending of soil characteristics and types. This blending would modify physical characteristics of the soil structure, texture, and rock content, potentially leading to a loss of soil productivity and reduced reclamation potential. Compaction due to construction activities, such as grading the well pad and access road, would reduce aeration, permeability, and water-holding capacity of the soils. An increase in surface runoff can be expected, potentially causing increased sheet, rill, and gully erosion. The soils associated with the project area range from moderately susceptible to sheet and rill erosion to high potential as a result of water.

Wind erosion would be expected to be a minor contributor to soil erosion with the possible exception of dust from vehicle traffic during all phases of development. Vehicle traffic related wind erosion would be limited to approved travel routes in which the surface has not been paved or dressed in a material to prevent soil movement and greatest during the drilling and completion phases. During production, traffic would be typically once per day by a light-weight pickup truck. The impacts of wind erosion could

result in increased indirect impacts such as runoff, erosion and off-site sedimentation. The susceptibility for the soil types in the project area to be lost by wind is low to moderate.

Additional soil impacts associated with development would occur when heavy precipitation causes water erosion damage. When water saturated segment(s) on the access road become impassable, vehicles may still be driven over the road. Consequently, deep tire ruts would develop. Where impassable segments are created from deep rutting, unauthorized driving may occur outside the designated route of access roads.

Contamination of soil from drilling, hydraulic fracturing, and production wastes mixed into soil or spilled on the soil surfaces could cause a long-term reduction in site productivity. Contaminants spilled on soil would have the potential to pollute and/or change the soil chemistry. See section 4.2.9 – Wastes, Hazardous or Solid for a more in-depth analysis of spill contamination. The potential for contamination can be reduced or avoided through proper handling and storage of contaminants; proper use and maintenance of equipment; and implementation of a SPCC Plan, BMPs and Conditions of Approval.

Mitigation

The project area would be sprayed with water during the construction phase and aggregate and/or soil cement would be placed on the access road and well pad to prevent unnecessary loss of soil, if proper compaction cannot be achieved.

The operator would stockpile the topsoil from the surface of well pads which would be used for surface reclamation of the well pads. The impact to the soil would be remedied upon reclamation of well pad. The stockpiled topsoil would be re-spread across the recontoured pad; proper soil techniques (such as ripping and discing) would be used to develop a proper seed bed for revegetation.

During the life of the development, all disturbed areas not needed for active support of production operations should undergo “interim” reclamation in order to minimize the environmental impacts of development on other resources and uses. Upon abandonment of wells and/or when access roads are no longer in service final reclamation would be implemented. Earthwork for interim and final reclamation must be completed within 6 months of well completion or well plugging (weather permitting).

Road construction requirements and regular maintenance would alleviate potential impacts to access roads from water erosion damage.

Fluid impermeable containment systems (i.e. liners, dikes, berms) would be placed in, under and/or around any tank, pit, drilling cellar, ditches associated with the drilling process, or other equipment that use or has the potential to leak/spill hazardous and non-hazardous fluids, to completely prevent soil contamination (e.g. liners) at the site or to prevent the spill from going beyond the immediate site (e.g. dikes, berms).

4.2.2.1 Farmlands, Prime or Unique

A recent trend in land use in some parts of Grady County has been the loss of prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated. Direct impacts resulting from the disturbances can affect the soil properties, increase erosion, and reduce water infiltration potentially affecting the characteristics unique to prime farmlands.

It is anticipated that there would be no permanent loss of prime or unique farmland once all reclamation activities are complete. Initial construction, development, and production phases would utilize approximately 36.98 acres of soils identified as prime farmland. When the well is no longer productive, the 2.64 acres of prime farmland would be reclaimed and returned to baseline conditions.

Mitigation

When removing soil, the three major mineral soil horizons (A, B, and C) would be removed and stockpiled independent of one another. All separation would occur prior to implementation of any other construction activities. During the interim and final reclamation phases, the three independently stockpiled soil layers would be replaced in the reverse order that they were removed with the C horizon placed first followed by B, then A.

The soil and water resources mitigation measures would also minimize the impacts to prime or unique farmlands.

4.2.3 Water Resources

Oklahoma law requires any person who uses groundwater or water from a stream to obtain a permit from the OWRB, excluding water for use for domestic purposes. Permits are either long-term (one year or more) or short-term. The OCC has generated blanket rules (OCC Rule 165.10-3-10[a]) that prohibit pollution of any surface or subsurface freshwater source from well development activities.

4.2.3.1 Surface Water

Four types of potential impacts to surface water resources could occur as a result of Cimarex's proposed drilling operations:

- Increased sedimentation and turbidity of surface water as a result of ground disturbance and increased erosion into surface waters via runoff;
- Effects on water quality (i.e., potential contamination of surface water resources with drilling fluids, petroleum, or other chemicals for natural gas drilling),
- Disruption of normal flow patterns of surface water from the presence of roads and drill pads;
- Localized depletion of surface water.

In general, the potential for adverse impacts would be greatest in the short-term during construction and drilling/HF/completion activities and would decrease in time due to completion of surface disturbing activities, natural stabilization, reclamation, and revegetation. The magnitude of these potential impacts to surface water resources depends on: slope, aspect, and gradient; soil type; duration and timing of activities; and the success or failure of reclamation and protection measures.

The potential for erosion and sediment transport is greatest in areas where ground surfaces have been disturbed and the soil is exposed to wind or water. The project area soils have low to moderate susceptibility to erosion from wind and moderate to high susceptibility to erosion from water. The site would experience an increase in potential runoff during production. Areas of long-term disturbance, in particular those that are compacted aggregate, would have run-off potential similar to asphalt or concrete where there is no potential for infiltration and all water would travel to non-compacted surfaces.

The project area is located in cropland. All runoff from the project area is predicted to flow east across cropland into the Canadian River. Canadian River is approximately 1,000 feet east of the proposed disturbance areas. The Canadian River flows easterly into the Lake Eufaula. None of the water bodies are navigable; however, the named and unnamed drainages may be jurisdictional waters of the U.S.

There is potential for drainages to be modified in stream morphology as a result of increased water movement and sediment transport from ground-disturbing activities. It is anticipated that some minor drainage channel modifications would occur but are not anticipated to affect down stream flow or water availability as a result of surface disturbance activities in or near these ephemeral drainages. To mitigate these effects, interim reclamation and revegetation of the proposed project would slow runoff prior to entering into the Canadian River. As well, to minimize the potential for impacts to surface water, BMPs, such as adding aggregate to areas needed for long-term production and final reclamation efforts, would be implemented.

Petroleum products and other chemicals, accidentally spilled, could result in surface contamination. Similarly, possible leaks from tanks, pipes, and valves could degrade surface and groundwater quality. A closed-loop drilling system will greatly reduce the chance of spills and surface contamination that could impact water quality during the drilling process. By containing all produced fluids, drill cuttings, and HF flowback in tanks and then disposing of them at an offsite facility, the chance for spills and contamination are greatly reduced. The proposed project would be implemented under applicable Federal, State, and Local rules and regulations. Potential impacts to surface water and water quality as a result of contamination would be minimized through the implementation of the SPCC Plan, BMPs, and COAs.

Implementation of the proposed action would impact surface water quantity in the short term during the construction, drilling, and HF phases. 5,880,000 gallons (18.05 acre-feet) of water needed for these phases would come from a private perennial source (Canadian River) approximately 1,000 feet east of the proposed project. The water will be transported by the use of a temporary surface water line. The

temporary waterline will run along the ag field; there will be no new disturbance from the temporary surface line.

4.3.3.2 Groundwater

Potential impacts to groundwater resources include: contamination or cross-contamination of aquifers during drilling and completion phases and localized depletion of groundwater resources.

Quality

Oklahoma has developed comprehensive regulatory standards for HF. These rules are listed in OCC Rule 165:10-3-10, which regulates well completion operations. OCC Rule 165 10-3-10(a) provides a general prohibition against pollution of any surface or subsurface fresh water from well completion activities. OCC Rule 165: 10-3-10(b) provides a rule reference guide to the 35 other OCC rules regarding the management of HF operations.

Proper casing and cementing represent the primary means of protecting groundwater during HF operations. OCC Rule 165: 10-3-4 contains minimum casing and cementing standards. Oilfield grade steel casing is required for all casing strings. Minimum cementing intervals are specified. Surface casing is to be cemented by circulating cement to the surface. Production casing is required to be cemented a minimum of 200 feet above producing zones. OGCD inspectors witness cementing to ensure it meets all OCC standards. If the inspector does not witness cementing, and in other instances based on site-specific circumstances, a cement bond log can be required. Each string of casing must be pressure-tested to a minimum of 1,500 pounds of pressure.

The OCC administers the Hydraulic Fracturing Disclosure Rule which requires operators to list the specific fluids and additives used in HF treatments on the FracFocus website, a public website hosted by the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission. Additionally, the OCC requires operators to disclose the total amount of water used in HF treatments on FracFocus.

The wellbore would be cased per the drilling, casing and cementing program features included with the well's APD and meet all BLM and OCC rules and regulations on casing. For fracturing fluid to escape the wellbore and affect the usable quality water or contaminate or cross contaminate aquifers, the fluid would have to breach several layers of steel casing and cement. Failure of the cement or casing surrounding the wellbore is a possible risk to water supplies. If the annulus is improperly sealed, natural gas, fracturing fluids, and formation water containing high concentrations of dissolved solids may be transferred directly along the outside of the wellbore among the target formation, drinking water aquifers, and layers of rock in between. Complying with BLM and state regulations regarding casing and cementing, implementing BMPs, testing casings and cement prior to continuing to drill or introducing additional fluids and continual monitoring during drilling and HF allow producers and regulators to check the integrity of casing and cement jobs and greatly reduce the chance of aquifer contamination.

An expressed public concern about subsurface HF operations in deep shale formations is that the process might create fractures that extend well beyond the target formation to water aquifers, allowing methane, contaminants naturally occurring in formation water, and fracturing fluids to migrate from the

target formation into drinking water supplies (Zoback et al 2010). Many thousands of feet of rock separate most major gas-bearing shale formation in the U.S. from the base of aquifers that contain drinkable water (GWPC 2009). The OCC determined that the base of treatable water at the project location is found 240 feet below the surface. Over 7,500 feet of isolating layers of rock are between the aquifer's base and the top of the zone that is undergoing tight shale HF (about 8,050 feet). The direct contamination of underground sources of drinking water from fractures created by HF would require hydrofractures to propagate several thousand feet beyond the upward boundary of the target formation through many layers of rock. It is extremely unlikely that the fractures would ever reach fresh water zones and contaminate freshwater aquifers (Zoback et al 2010, RRC 2013).

Most used (flowback) water would be hauled away to be injected into disposal wells with little recycling. It is estimated that approximately 30 percent of the injected water returns without too much of a quality decrease, whereas the remaining 40 percent is more degraded. Since the flowback would be disposed of at a regulated and permitted commercial facility, it is assumed that they would ensure all water quality regulations and laws are followed and that BMPs are in place to prevent contamination of aquifers, thus having no impact on water quality in the aquifers from flowback.

Quantity

Groundwater belongs to the land surface owner and may be used subject to the Oklahoma Groundwater law. A permit is required for non-domestic use. In order to obtain a permit, an applicant must prove that they own or lease the land surface, that the land lies over a groundwater basin, that the proposed use will be beneficial, and that waste of groundwater will not occur.

Impacts of water use for shale-gas production depend on local water availability and competition for water from other users. Overall, impacts range from declining water levels at the regional or local scales and related decreases in base flow to streams (Nicot and Scanlon 2012).

The large number of hydraulically fractured wells in Oklahoma and high water use per well create the perception of large rates of water use. However, water use for shale production is relatively minor (<1%) when compared to that for mostly irrigation (56%) and municipal (26%) water use in Oklahoma in recent years.

Surface water is not readily available year round near the project area, so water user groups primarily use groundwater resources. Other competing water uses in the region include irrigation and municipal demands. Unlike municipal water use, which increases steadily with population growth, shale water use represents a transient demand over 30 to 40 years. The concern is whether the aquifer being tapped can recover from the transient stress rapidly enough to support additional demand from population growth, or if that shortage can be made up from surface water sources.

Water supplied for fracturing water would come from a nearby river. The proposed action would not use groundwater from the aquifer and therefor would not impact the quantity of water in the aquifer.

Mitigation for Surface and Ground Water Resources

The use of a closed-loop system and closed tanks during the drilling and HF phases of the project would reduce or eliminate seepage of drilling fluids into the soil and eventually reaching groundwater. The SPPC Plan would be implemented to prevent spills or produced fluids that could result in contamination of the soils onsite, or offsite, and may potentially impact surface and groundwater resources in the long term. Casing and cementing requirements imposed on proposed wells would reduce or eliminate the potential for groundwater contamination from drilling muds and other surface sources

4.2.4 Wetlands, Riparian Areas

Surface disturbance from the well pad, access road, and pipeline can result in impairment of the floodplain values from removal of vegetation, removal of wildlife habitat, impairment of water quality, decreased flood water retention and decreased groundwater recharge

There is a lack of all three wetland indicators within the project area. Additionally, the NWI showed no wetland or riparian habitat within 300' of this project. Due to the lack of wetland indicators, a determination of "No Impact" on wetland habitat has been assessed for the proposed project.

4.2.5 Heritage Resources

4.2.5.1 Cultural Resources

The proposed action would result in short-term and long-term change and altered utilization of the site and immediate surrounding area. After the literature review and on-the-ground survey, it was determined that no additional research is needed. The Oklahoma State Historic Preservation Office has been consulted and Section 106 of the NHPA, as amended, compliance has been completed. The determination of effect for this project, is No Historic Properties Affected

Many cultural resource issues exist beyond the National Historic Preservation Act, such as state and municipal registers of historic sites, National Heritage Areas, National Trails, or other heritage designations. This action does not affect any of these other types of cultural resources.

Mitigation

In the event that lease development practices are found in the future to have an adverse effect on significant cultural resources, the BLM and the operator, in consultation with the affected tribe(s), the Oklahoma State Historic Preservation Office, and the Oklahoma Archaeological Survey, will take action to mitigate those effects. Measures include, but are not limited to physical barriers to protect resources, relocation of practices responsible for the adverse effects, or other treatments as appropriate.

If archeological materials such as chipped stone tools, pottery, bone, historic ceramics, glass, metal, or building structures are exposed during construction; stop work at that spot immediately and contact the

BLM archeologist at (918) 621-4100. In these situations, the Oklahoma Antiquities Law (Oklahoma Statute Chapter 20, Section 361) may apply and its procedures followed.

If human remains are discovered the procedures of the Oklahoma Burial Desecration Law (Oklahoma Statute Chapter 47, Section 1168.0 - 1168.6) or the NAGPRA shall apply, as appropriate.

4.2.5.2 American Indian Religious Concerns

The Apache Tribe of Oklahoma, Cheyenne and Arapaho Tribes, Chickasaw Nation, Comanche Nation, Muscogee (Creek) Nation, Fort Sill Apache, Kiowa Tribe, the Osage Nation, Seminole Nation, and Wichita and Affiliated Tribes were notified of the project.

The proposed action is not known to physically threaten any TCPs, prevent access to sacred sites, prevent the possession of sacred objects, or interfere or otherwise hinder the performance of traditional ceremonies and rituals pursuant to AIRFA or EO 13007. There are currently no known remains that fall within the purview of NAGPRA or ARPA that are threatened by leasing.

Mitigation

In the event that lease development practices are found in the future to have an adverse effect on TCPs, the BLM and the operator, in consultation with the affected tribe(s) will take action to mitigate or negate those effects. Measures include, but are not limited to physical barriers to protect resources, relocation of practices responsible for the adverse effects, or other treatments as appropriate.

4.2.5.3 Paleontology

No concentrations of vertebrate fossils or bone beds are known to occur within the APE, and there is a very low probability of any occurring within the APE, thus there would be no impact from implementation of either alternative.

Mitigation

If paleontological material such as vertebrate fossils are exposed; stop work at that spot immediately and contact the BLM archeologist. In the event that lease development practices are found in the future to have an adverse effect on paleontological resources, the operator and the BLM will take action to mitigate or negate those effects. Measures include, but are not limited to physical barriers to protect resources, relocation of practices responsible for the adverse effects, or other treatments as appropriate.

4.2.6 Invasive, Non-native Species

Noxious and invasive weeds can occur within the proposed project area. Often times noxious and invasive weeds are spread from oil and gas development activities that cause disturbance. Weeds and weed seed can be transported and spread by any vehicles, equipment/tools, or earthen materials used during all phases of well development, production, and reclamation that are transported to the site.

Weeds and weed seed can be attached to equipment and vehicles thus having the potential to spread over large areas and introduce seed to new sites where they could establish a new population

One species has been identified as occurring in Grady County, while the other two species have the potential to be found in or near the project area. The project area provides or will provide marginal to suitable habitat for the three species and could result in the establishment of the species within the project area as a result of proposed activities. Keeping surface disturbance to the smallest area possible along with timely interim and final reclamation efforts using certified weed-free seed, hay, straw or other materials would minimize the potential introduction and spread of invasive and non-native species

Mitigation

Only certified weed-free hay, straw and/or any other materials used for erosion control or other reclamation activities would be used. Only certified weed-free gravel and earthen materials for road surfacing and maintenance would be used.

4.2.7 Vegetation

Surface-disturbing activities would have localized effects on vegetation by removing, trampling, burying, and killing the vegetation anywhere an area needs to be cleared for the well pad or access road. The churning of soils by heavy equipment can cause changes to soil properties and loss of substrates necessary for plant growth and in effect reduce the potential for native species to reestablish. The natural seedbanks that exist in the soil would also be lost and have to be reestablished after reclamation. As well, surface-disturbing activities would cover nearby plants with fugitive dust, although this would be minimized by implementing BMPs and spraying the area with water. All of these impacts lead to a greater potential for non-native, undesirable weedy species to establish and outcompete the remaining native species.

Long-term impacts would be limited to those areas compacted and covered in aggregate to create a travel surface, such as the production area of the well pad and access road (2.57 acres), as a result of no vegetation or continually disturbed vegetation for the life of the well. Impacts from a portion of the pad, road, and pipeline (37.37 acres) would be short-term and return close to baseline after successful interim reclamation. Interim and final reclamation should result in vegetation establishment in three to five growing season (one to two years) with appropriate techniques used and adequate precipitation. Inadequate precipitation over several growing seasons could result in loss of vegetative cover, leading to weed invasion and deterioration of native vegetation

Habitat fragmentation can occur through splitting a formerly contiguous habitat block into one or more pieces. By constructing and maintaining a well pad, access road, and pipeline right-of-way habitat fragmentation is likely to occur. Approximately 40.01 acres within the Prairie Tableland ecoregion would be altered. The proposed pad, access road, and pipeline are within already disturbed cropland that is also highly influenced by farming practices, which is not characteristic of the traditional ecoregion. The surrounding areas include oil and gas development, extensive federal, state, county, city, and lease road

system, agriculture lands, and urban development. These areas have been significantly altered from the native ecoregion habitat type and have been significantly fragmented. The impact from the proposed action on the overall habitat and ecoregion is anticipated to be minor and insignificant.

Mitigation

Disturbed areas not needed for the production facility need to be reclaimed using certified weed-free, native seed mixes as recommended by the Natural Resource Conservation Service for the area or per the surface use agreement. The existing interim reclamation that occurred was not successful and needs to be redone.

Once a well is no longer producing, final reclamation would be implemented and native vegetation reestablished on all disturbed areas. Topsoil and subsoil would be stockpiled separately to prevent additional mixing of soil properties and structure.

4.2.8 Wildlife

4.2.8.1 Threatened and Endangered Species

No Federally protected species or critical habitat is present in the proposed project location. As well, there is no potential habitat for any listed species present. Implementation of the proposed project would have "No Effect" on any threatened and endangered species or their critical habitat.

4.2.8.2 Special Status Species

No State listed species or their critical habitat is present in the proposed project area. As well, there is no potential habitat for any listed species present. Implementation of the proposed project would have "No Effect" on any State listed species or their critical habitat.

4.2.8.3 Migratory Birds

The Service estimates that many migratory birds are killed annually throughout the United States in oil field production skim pits, reserve pits, and centralized oilfield wastewater disposal facilities. Numerous grasshoppers, moths, June bugs, and the like become trapped on the surface in tanks and on pits, and become bait for many species of migratory birds. Open tanks and pits then become traps to many species of birds protected under the MBTA. Properly covered tanks and pits (and regularly inspected covered tanks and pits) is imperative to continued protection of migratory birds in the well pad area.

Mitigation

The following temporal and spatial conservation measures must be implemented:

- 1) Avoid any take of migratory birds and/or minimize the loss, destruction, or degradation of migratory bird habitat while completing the proposed project or action.

- 2) If the proposed project or action includes a reasonable likelihood that take of migratory birds will occur, then complete actions that could take migratory birds outside of their nesting season. This includes clearing or cutting of vegetation, grubbing, etc.
- 3) If no migratory birds are found nesting in proposed project or action areas immediately prior to the time when construction and associated activities are to occur, then the project activity should proceed as planned
- 4) If migratory birds are present and nesting in the proposed project or action area, work should cease until fledglings had left the nests on their own.

4.2.8.4 Wildlife

The proposed action would remove food, cover, and space for wildlife in this area. The more mobile species will move away from the area during the construction, drilling, and well completion phases of this mineral exploration project to avoid direct mortality, the increase in human presence, and levels of noise. The less mobile species could suffer some mortality during the active construction phase of the project. The immediate area of the drilling/production pad will be unavailable as wildlife habitat while the well is in the drilling/production phases (as long as 20 year or more).

Mitigation

The Wildlife Resource General Conditions of Approval (WRGCOAs) included in the approved APD and use of standard Best Management Practices (BMPs) should provide extra measures of protection to general wildlife populations and habitats in the area. Impacts to the wildlife resource component of the environment can be avoided or minimized by adopting the WRGCOAs and BMPs. Notice to Lessees (NTL) 96-01-TDO (Modification of Oil and Gas Facilities to Minimize Bird and Bat Mortality) address measures designed to protect migratory birds from accidental deaths associated with power line collisions/electrocutions, open-vent exhaust stacks and open pits and tanks.

4.2.9 Wastes – Hazardous or Solid

All hazardous and non-hazardous materials would be transported to the well location, in appropriate sacks or containers, immediately before or during the operation for which they are being used. Small quantities may be stored on-site in appropriate containers. Waste fracturing fluids would be collected in above-ground tanks and hauled from location and reused at another well or disposed of at an authorized facility. Produced water would be stored in tanks at the well location and transported by truck to an off-site disposal facility. Solid, non-hazardous wastes (i.e. garbage, excess construction materials) would be contained in portable fully enclosed trash cages and hauled from location by a private garbage collection company. Cut woody vegetation may be chipped or mulched and spread across the project area or sold. All other fluid or solid wastes that require special handling or disposal, per the Material Safety Data Sheet (MSDS) or manufacture recommendations, would be followed, stored and disposed of in the recommended manner. No hazardous substances as defined by 40 CFR 355 would be used, produced, stored, transported or disposed of in amounts above threshold quantities.

In HF, chemical substances other than water make up a small percentage of the fluid composition, however, the very large volumes used require correspondingly large volumes of a variety of compounds. These substances range from the relatively benign to the highly toxic at certain concentrations. In addition to these added chemicals, naturally occurring toxicants such as heavy metals, volatile organics, and radioactive compounds are mobilized during extraction and return to the surface with the produced water. Of the millions of gallons of water used to HF a shale gas well one time, less than 30 percent to more than 70 percent may remain underground (Bamberger and Oswald 2012).

Most industrial processes use chemicals and almost any chemical can be hazardous in large enough quantities or if not handled properly. Even chemicals that go into our food or drinking water can be hazardous. For example, drinking water treatment plants use large quantities of chlorine. When used and handled properly, it is safe for workers and near-by residents and provides clean, safe drinking water for the community. Although the risk is low, the potential exists for unplanned releases that could have serious effects on human health and environment. The same is true for HF, a number of chemical additives are used that could be hazardous, but are safe when properly handled according to requirements and long-standing industry practices. In addition, many of these additives are common chemicals which people regularly encounter in everyday life (GWPC 2009).

Surface spills of drilling mud and additives, HF fluids and additives, flowback water, and other produced water can happen at a variety of points in the development and production phases. Spills that occur can span a range of different spill sizes and causes of failure at any point in the process. For example, small spills often happen as the result of poor pipe connections or leaks; large spills sometimes occur as the result of a major well blowout, but such blowouts rarely occur. Additionally, spills from some parts of the phases may be the result of human error (i.e. vehicle collisions, improper handling, improper equipment operation or installation, etc.), while others stem from equipment failure (i.e. broken pipes, torn pit liners, leaking tanks, etc.) or acts of nature (Fletcher 2012). The most common cause of spills comes from equipment failure and corrosion (Wenzel 2012).

The cause of the spill, the spill size, the hazard rating of the spilled material, response time to clean up the spill and the effectiveness of the cleanup, all play a critical role in determining the overall impact on the environment. The volume of a spill can significantly vary with spill types. Pipe spills are not expected to release more than 1,000 gallons into the environment; retaining pit spills and truck spills are not expected to release more than 10,000 gallons of fluid; and blowouts are expected to cause the largest spills, with the potential to release tens of thousands of gallons into the environment. Small spills occur with greater frequency than large spills. Secondary containment or recovery for small spills would likely minimize if not eliminate any potential release into the environment. However, for spills on the order of several thousands of gallons of fluid, it is expected that less than half the fluid may be captured by secondary containment or recovery. The vast majority of shale gas operations do not incur reportable spills (5 gallons or more), indicating the fluid management process can be, and usually is managed safely and effectively (Fletcher 2012).

Surface water or groundwater could be impacted if the substance were to be carried off to a surface water source during a rain event or percolates into the aquifer. Hazardous substances could

contaminate soil and damage or kill nearby vegetation or wildlife if exposed. It is uncommon for such events to occur since there are several layers of safety and precautions taken to ensure hazardous wastes are not released into the environment. In the case of any release, emergency or otherwise, the responsible party is liable for cleanup and any damages.

The principal concern for NORM in the Oil and gas industry is that, over time, it can become concentrated in field production equipment. If measured NORM levels exceed state regulatory or OSHA exposure dose risks (29 CFR 1910.1096), the material is taken to licensed facilities for proper disposal. Currently there are no existing federal regulations that specifically address the handling and disposal of NORM wastes. The Oklahoma Department of Environmental Quality regulates disposal of oil and gas NORM.

The laws, regulations, SPCC Plan, COAs, NTLs, and BMPs associated with this lease and project are expected to adequately minimize risk and mitigate potential issues associated with hazardous or solid wastes under the proposed action.

Once a waste is taken to a disposal facility it is assumed that the facility would comply with all federal and state regulations regarding proper handling and disposal of the waste to minimize the risk of spills and contamination. Analysis of the potential for contamination at these sites is beyond the scope of the project, as the operator is no longer responsible for the waste.

Mitigation

The following measures are common to most projects: all trash would be placed in a portable trash cage and hauled to an approved landfill, with no burial or burning of trash permitted; chemical toilets would be provided for human waste; fresh water zones encountered during drilling operations would be isolated by using casing and cementing procedures; containment ditches would be dug and lined to capture spilled fluids; a berm or dike would enclose all production facilities if a well is productive; and all onsite waste would be hauled to an approved disposal site.

4.2.10 Mineral Resources

Production of natural gas wells would contribute to the draining of hydrocarbon-bearing reservoirs within the Woodford Shale play. Production rates for oil would be highest during the first few years and then steadily decline over the life of the project until the well is no longer producing and is plugged and abandoned.

Other commodities such as uranium, limestone and dolomite, asphalt, and sand and gravel are surface mined, therefore, there should be no conflict between mining for the commodity and the fluid mineral development, except for the 2.64 acres of long-term disturbance that would be removed from any potential surface mining activities until the well is abandoned and reclaimed.

Mitigation

Spacing orders and allowable production orders are designed to conserve the oil and/or gas resource and provide maximum recovery.

4.2.11 Visual Resources

The primary issue associated with visual resources is the degree of visible change that may occur in characteristic landscapes, viewsheds, and areas with high scenic value. Project activities can introduce differing elements of form, line, color, and texture into the landscape through construction or placement of constructed features such as roads, structures, equipment, or manipulation of vegetation. Effects can also result when actions change scenic integrity or result in conditions that produce unattractive landscapes.

Impacts associated with oil and gas development on visual quality include visibility of constructed features such as roads, well pads, pipelines, tank batteries; road degeneration from heavy trucks and vehicles following rain and snow; and unreclaimed sites and discarded equipment. Under Alternative B, construction of the new well pad and access road and associated production facilities have the greatest potential to alter visual conditions. Other components associated with oil and gas production and development include water disposal facilities, onsite storage tanks, and compressor stations.

Well pad and access road construction involves clearing vegetation and constructing cuts and fills. These would present an obvious contrast in color with the surrounding vegetation. The cleared areas may be visually prominent at foreground and middleground distance zones for more than a decade. These areas would be most obvious immediately after construction. Impacts would decrease as the disturbed surface began to blend in color, form, and texture, when interim reclamation occurs. Reclamation efforts would reduce visual impacts once revegetated areas establish.

Short-term impacts may occur where construction-related equipment, activities, and dust would be visible to observers. During the anticipated 90 to 120-day construction, drilling, HF, and completion periods, the presence of heavy equipment, night-time lighting, and dust generated by equipment and traffic may detract from the visual quality of the landscape. These actions may be visually and audibly intrusive to residents and others traveling through the area. The visual impacts would be near heavily traveled public roads and near residential areas. The existing surround of trees masks the project disturbance area some.

Long-term visual impacts at well locations would persist as long as the well is producing, which could be a couple of years to more than 40 years. Long-term impacts may include vegetation removal, alteration of the landscape, and installation of equipment and facilities.

The most visible component of the proposed facilities would be the pumping units at the well site, as well as the clear-cuts associated with the access road, well and tank battery pads, and flow lines. Flow lines would be buried and have less impact than if they were laid on the surface. The additional components can degrade scenery and change the setting, as well as degrade the natural appearance of the foreground.

When abandoned, the facilities would be removed and the wells plugged. The entire pad would be contoured and reseeded in order to blend with the existing topography and vegetation. Successful reclamation of the well pad, access road, and facilities would occur resulting in the long-term visual disturbance from construction being negated.

Implementing the proposed project would not result in any irretrievable or irreversible visual resource damage

Mitigation

All production related facilities/equipment will be painted, and all painted surfaces will be maintained to ensure its integrity, according to API, BLM, and surface owner specifications.

4.2.12 Socioeconomics, Environmental Justice, and Public Safety

4.2.12.1 Socioeconomics and Environmental Justice

No minority or low income populations would be affected as a result of implementing the proposed action. Permitting the well would temporarily, positively impact the local economy of Grady County through the creation of additional job opportunities in the oil and gas industry and in supporting trades and services. After construction and drilling is complete, there would be a marked reduction in employment opportunities and the need for materials and supplies. Only those employees operating and maintaining the unit would continue to have consistent, year-round employment. Many employee and contractor needs would be met through hiring from the local workforce, including road and pad construction contractors, pumpers, pipeline station operators, and office staff. A portion of drilling rig operations and drilling consultant functions, along with part of the well completion and reclamation, would also likely utilize local contract employees. Some specialty contractors and materials would likely be hired from outside the area due to the specific nature of their jobs.

State and County governments would experience an increase in tax and royalty revenues. Taxes and royalties would continue to benefit the communities as long as the well is producing. The lifetime expectancy of a shale well is generally 40 years. Some minor economic loss to the private landowners may result from the loss of the use of 40.01 acres of pasture and cropland in the short-term and 2.64 acres in the long-term; however, the landowner would also be receiving royalties on the oil and gas produced as well as damage payments for the use of the land. Local revenues in the service and retail sectors would temporarily increase from the influx of people during the construction, drilling, and completing phases.

4.3.12.2 Public Safety

Shale development, especially during drilling and HF, can create short-term increases in traffic volume, dust and noise. These nuisance impacts are usually limited to the 90 to 120-day construction, drilling, HF, and completion phases. These impacts would be significantly reduced during production, when the site would be visited no more than once per day to inspect.

Oil and gas development has significantly increased road traffic by heavy trucks in rural areas, where most roads were originally built for light-duty use. The traffic and specialized equipment associated with drilling and production puts a strain on local roads that leads to premature asphalt wear and tear, ripples, potholes, and torn shoulders. The increase can greatly impact the local community's safety as well as their commute time. The service life of the highway systems and county roads has been reduced by an average of 30 percent and add to the state and local government's costs for maintenance and repairs, which is then typically passed onto tax payers unless maintenance agreements between the operator and the local/state government have been implemented (RRC 2013c).

The principal concern for naturally occurring radioactive material (NORM) in the oil and gas industry is that, over time, it can become concentrated in field production equipment and as sludge or sediment inside tanks and vessels that have an extended history of contact with formation water. Because the general public does not come into contact with oilfield equipment for extended periods, there is little exposure risk from oilfield NORM. Studies have shown that exposure risks for workers and the public are low for conventional oil and gas operations (GWPC 2009).

Mitigation

No mitigation measures specific to socioeconomic, environmental justice, or public safety would be required

4.2.13 Cumulative Effects

4.2.13.1 Effects Common to All Resources

Analysis of cumulative impacts for reasonably foreseeable development of oil and gas wells in Oklahoma was analyzed in the Oklahoma RMP (1994), as amended. Potential development of all available federal minerals in Oklahoma, including the project area, was included as part of the analysis. Total surface disturbance projected by the plan was based on an estimated 20 Federal wells being drilled annually in Oklahoma with an estimated 113 acres of disturbance. Over the last 10 years there have been no changes to the basic assumptions or projections described in the Oklahoma RMP (1994), as amended, analysis

More than 100 years of oil and gas development in Oklahoma has resulted in an extensive infrastructure of existing roads and pipelines. The Oklahoma Corporation Commission reports a total of 115,000 oil wells and 65,000 natural gas wells that are drilled and not plugged in Oklahoma. A total of 157,770 thousand barrels of oil was produced and a total of 2,499,599 million cubic feet of natural gas was produced in 2015. Rotary rig count fluctuated with a low of 81 up to 139 rigs in operation per month for 2015

The cumulative impacts fluctuate with the gradual reclamation of well abandonments and the creation of new additional surface disturbances in the construction of new access roads and well pads. The ongoing process of restoration of abandonments and creating new disturbances for drilling new wells gradually accumulates as the minerals are extracted from the land. Preserving as much land as possible and applying appropriate mitigation measures will alleviate the cumulative impacts.

The cumulative environmental impacts of HF on rural landscapes remains unknown and the impacts of gas drilling operations continue to result in environmental degradation (Wenzel 2012). Additional research is needed to assess the impacts further especially at the watershed and regionally level.

4.2.13.2 Effects on Air Resources

The following analysis of cumulative impacts of the proposed action on air quality will be limited to the Grady County in which the proposed action would occur.

The primary activities that contribute to levels of air pollutants in the county are predominately combustible engines of road and non-road, diesel and gasoline vehicles and equipment. The Air Resources Technical Report includes a description of the varied sources of national and regional emissions that are incorporated here to represent the past, present and reasonably foreseeable impacts to air resources (BLM 2014). It includes a summary of emissions on the national and regional scale by industry source. Sources that are considered to have notable contributions to air quality impacts and GHG emissions include electrical generating units, fossil fuel production (nationally and regionally) and transportation.

The very small increase in emissions that could result from approval of the proposed action or preferred alternative would not result in the area violating the NAAQS for any criteria pollutant. In October 2012, EPA regulations that require control of VOC emissions from oil and gas development became effective. These regulations will reduce VOC emissions from oil and gas exploration and production emissions that contribute to the formation of ozone. Emissions from any lease development are not expected to impact the 8-hour average ozone concentrations, or any other criteria pollutants in the area of the proposed lease.

The cumulative impacts of GHG emissions and their relationship to climate change are evaluated at the national and global levels in the Air Resources Technical Report (BLM 2014). The very small increase in GHG emissions that could result from approval of the proposed action would not produce climate change impacts that differ from the No Action Alternative. This is because climate change is a global process that is impacted by the sum total of GHGs in the Earth's atmosphere. The incremental contribution to global GHGs from the proposed action cannot be translated into effects on climate change globally or in the area of this site-specific action. It is currently not feasible to predict with certainty the net impacts from particular emissions associated with Federal actions, however, EPA's recently finalized oil and gas air quality regulations have a co-benefit of methane reduction that will reduce greenhouse gas emissions from any oil and gas development that would occur on this lease.

4.2.13.3 Effects on Water Resources

The demand in Basin 58 accounts for about 11% of the total demand in the Central Watershed Planning Region and is expected to increase by 33% (11,830 AF/year) from 2010 to 2060. The majority of the demand and largest growth in demand is expected to be from the Crop irrigation demand sector. Substantial growth in demand is also expected in the oil and gas sector.

Currently, surface water is used to meet 70% of the total demand in the basin and is expected to increase by 38% (9,420 AFY) from 2010 to 2060. Alluvial groundwater is currently used to meet 19% of the total demand and is expected to increase by 20% (1,390 AFY) from 2010 to 2060. Bedrock groundwater is used to meet 11% of the total demand in Basin 58 and its use will increase by 26% (1,020 AFY) from 2010 to 2060. Most of the increases are expected to come from the Municipal and Industrial demand sector. The Oil and Gas sector used 1,940 AF per year in 2010 and is expected to be 1,940 AF per year in year 2060 (Central Watershed Planning Region Report, Version 1.1, OWRB).

Based on projected demand and historical hydrology, surface water gaps and alluvial groundwater depletions are expected to occur by 2020. There are no surface water gaps or bedrock groundwater depletions expected for 2060 demand conditions in the basin. Surface water gaps are anticipated in 2060, the gap is expected to be approximately 720 AF/month during the summer months. Alluvial groundwater depletions are expected to be up to 300 AF/month. Projected annual alluvial groundwater storage depletions are minimal relative to the volume of water stored in the major aquifers underlying the basin. However, localized storage depletions may adversely affect yields, water quality, and/or pumping costs.

Despite the high water use to implement the proposed project, cumulatively the proposed action is not expected to significantly contribute any long-term shortages in the basin.

5.0 CONSULTATION/COORDINATION

This section includes the resource specialists located within the OFO that specifically participated and provided input in review of the proposed project and development of this EA document (Table 9).

Table 9. Specialists participating in the review of the proposed project.

Resources	Not Present on Site	No Impacts	May Be Impacts	Mitigation Included	BLM Reviewer	Date
Air Quality			X	X	/s/ Craig Willems, Natural Resource Specialist	1/23/2017
Soil			X	X		
Watershed Hydrology			X	X		
Floodplains			X	X		
Water Quality - Surface			X	X		
Water Quality - Ground			X	X		
Cultural Resources	X				/s/Ryan Howell, Archeologist	6/18/19
Native American Religious Concerns	X					
Paleontology	X					
Areas of Critical Environmental Concern					/s/ Craig Willems, Natural Resource Specialist	1/23/2017
Farmlands, Prime or Unique			X	X		
Invasive, Non-native Species			X	X		
Vegetation			X	X		
Livestock Grazing	X				/s/ George Thomas, Wildlife Biologist	4/20/2015
Threatened or Endangered Species	X					
Special Status Species	X					
Wildlife/Migratory Birds			X	X		
Wetlands/Riparian Zones	X				/s/ Craig Willems, Natural Resource Specialist	1/23/2017
Wild and Scenic Rivers	X					
Wilderness	X					
Recreation	X					
Visual Resources			X	X		
Cave/Karst	X					
Wastes, Hazardous or Solid			X	X		
Environmental Justice			X			
Public Health and Safety			X			
Fluid Mineral Resources			X	X		
Rights-of-Way	X					

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7.0 AUTHORITIES

- The National Environmental Policy Act of 1969, as amended
- The Federal Mineral Leasing Act of 1938, as amended
- The Federal Land Policy and Management Act of 19971, as amended
- Title 40 Code of Federal Regulations § 1500
- Title 43 Code of Federal Regulations § 3100
- Onshore Oil and Gas Orders
- Notices to Lessees

APPENDIX A. FIGURES

Appendix A—Figure 1. Vicinity Map.

Appendix A—Figure 2. Location

Appendix A—Figure 3. Ecoregions

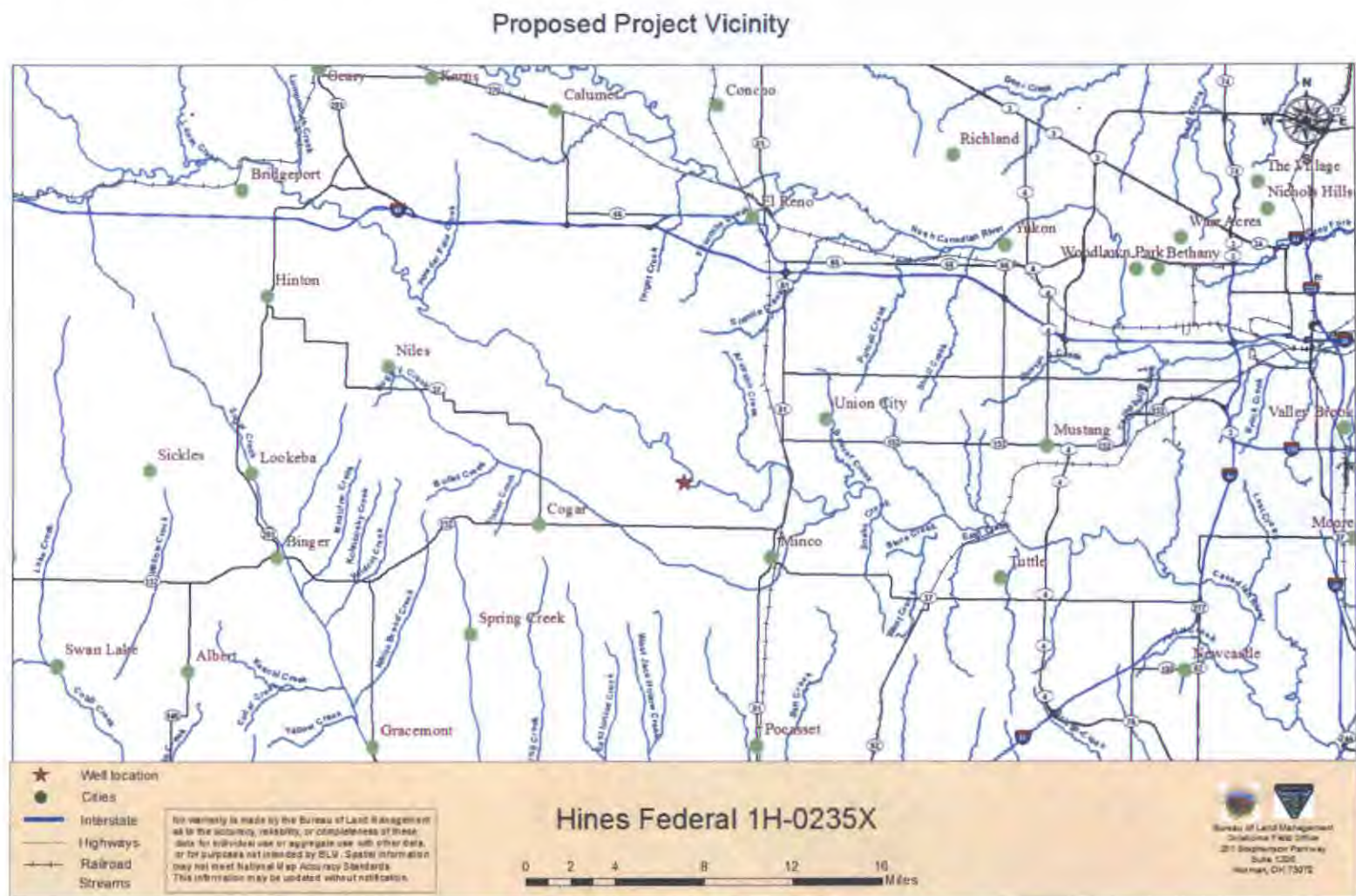
Appendix A—Figure 4. Photographs of the Project Area.

Appendix A—Figure 5. Floodplains Map

Appendix A—Figure 6. Soils Map

For all surface disturbance plats (e.g. elevation, cuts/fills, production facility layout, etc) see the APD well file.

Appendix A—Figure 1. Vicinity Map





Appendix A—Figure 3. Ecoregions



Appendix A—Figure 4. Photographs of the Proposed Project Area.

Well Stake looking North

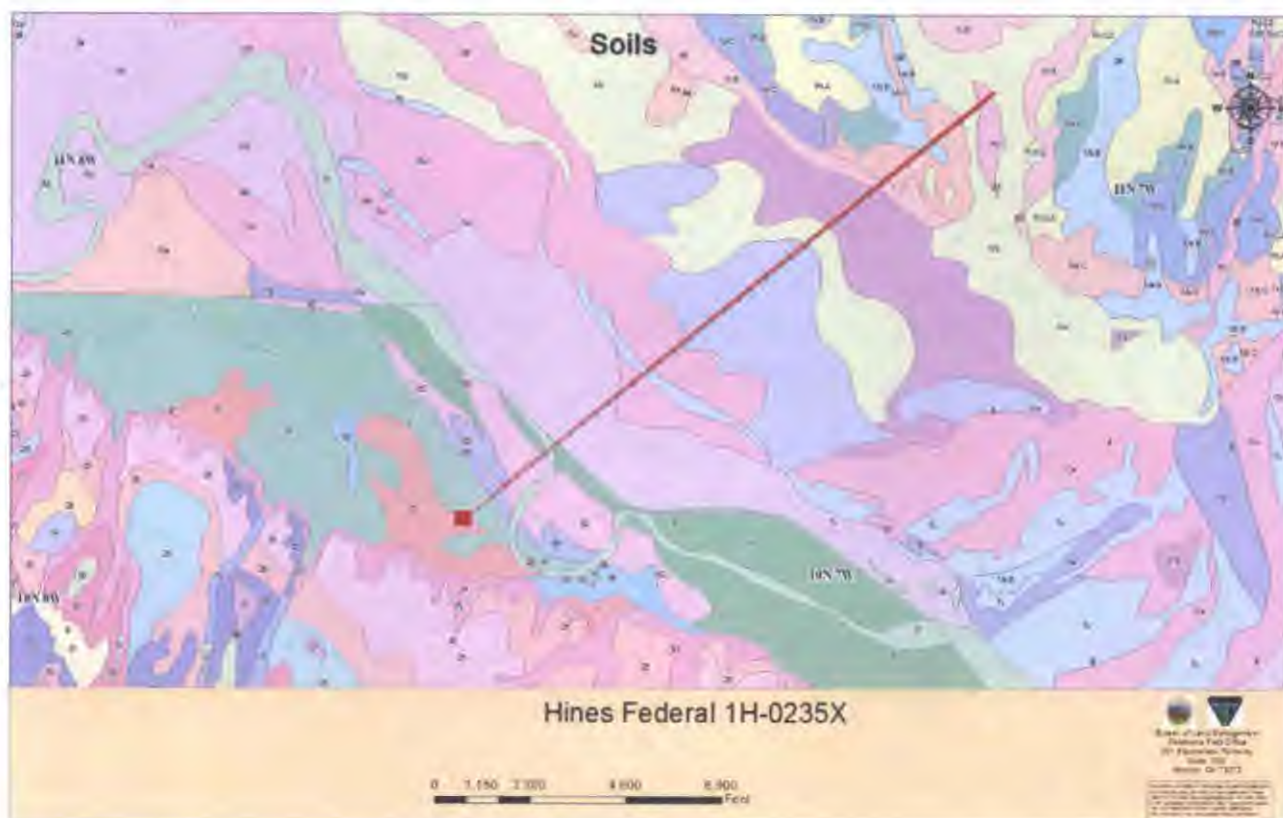


Access Road Take off (looking east)









APPENDIX B—SPECIAL CONDITIONS OF APPROVAL

General Restrictions and Requirements:

1. As stated in 43 CFR 3162.3-2, the issuance of this APD does not grant, convey, authorize, allow or otherwise imply approval or permission to conduct any associated activities off the approved pad area (i.e. well pad, access road, pipeline easement, utility easement). All surface disturbing activities associated with the drilling of this well will be restricted to the approved areas.
2. Per BIA regulations, no venting or flaring is permitted to be conducted during drilling or production of these wells. If venting or flaring is needed, the operator must submit a request to the BLM office prior to conducting the actions.
3. If the operator and/or surface owners wants or attempts to change or modify any of the terms and conditions of approval, the applicant/operator must contact the BLM OFO Natural Resource Specialist (Craig Willems, at swillems@blm.gov or (405)579-7177, before considering or implementing any changes or stipulations.
4. Operator shall give at least 48 hours' notice to the Natural Resource Specialist (Craig Willems) via e-mail at swillems@blm.gov or (405)579-7177.

5. Archaeology/Cultural:

An orange barrier fence shall be built around the water control structures known as archaeological site 34NB115. This will ensure that heavy equipment will not drive over or disturb these structures. The fence can be removed after the well is completed and the area reclaimed to the standards of the BLM.

If any new discoveries of archaeological material such as flint or stone tools, pottery, human bone, fire hearths, historic glass, ceramics, metal, or building foundations are exposed anytime during exploration operations; then all work at the location of such artifacts shall stop immediately and the operator and its contractors or subcontractors will immediately contact BLM staff archeologist at 918-621-4100, or BLM Multi-Resources Assistant Manager at 918-621-4187; and the State Historic Preservation Office called immediately. No further work at the location of artifacts should begin until the BLM notifies the operator to proceed.

a. In the event that lease development practices are found in the future to have an adverse effect on significant cultural resources, Traditional Cultural Properties, or paleontological resources, the operator and the BLM, in consultation with the affected tribe(s), the State Historic Preservation Office will take action to mitigate or negate those effects. Measures include, but are not limited to physical barriers to protect resources, relocation of practices responsible for the adverse effects, or other treatments as appropriate.

b. All surface disturbances must be within the proposed ground disturbance as it currently exists in the APD. Expansion of the pad or widening of the road is prohibited unless expressly

authorized by the BLM archaeologist. Any "in kind" land disturbing activities associated with this project at the request of the land owner are prohibited unless cultural clearance is provided and a cultural resources report is submitted by a BLM permitted archaeologist. These activities include but are not limited to: destruction of buildings, improvement of roads, removal of trees, bushes or any clear-cutting, or any other activity that would disturb the ground surface outside of the currently BLM approved areas

c. These conditions apply as essential terms and conditions of this APD. These requirements are made to comply with Section 106 of the National Historic Preservation Act as amended, the Native American Graves Protection and Repatriation Act, and the Code of Federal Regulations 36 CFR Part 800. Having gone through the permitting process successfully, the operator is fully aware that any future project that causes ground disturbance prior to a permit being issued by the BLM, will be a violation of NHPA and will be considered Knowing and Willful and may result in a denial of permit and will be forced to remedy any violation regardless of cost.

d. If human remains are discovered the procedures of the Oklahoma burial law or the NAGPRA shall apply

e. This authorization does not permit any surface disturbance on any other Federal or State Surface management agency or private land owners. The operator or their agent is responsible for obtaining permits, permissions, or Rights-of-ways from other surface management agencies prior to any ground disturbance and ensuring that cultural resources surveys are approved by those agencies.

Surface Disturbing Activities:

6. No construction or routine maintenance activities will be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of 6 inches deep, the soil shall be deemed too wet.
7. If soil is removed, at least the top 12 inches of soil material, or whatever salvageable, will be stripped and stockpiled (separate from the spoils pile) on an unutilized construction zone of the well pad. The stockpiled soil material will be spread on the portions of the well pad, which are to be reclaimed (including the cut and fill slopes and all portions of the well pad outside of the production facility) prior to reseeding. Spreading will not be done when the ground or topsoil is frozen or wet.
8. At a minimum, effectively install silt fencing (screening) and/or weed-free hay/straw bales prior to beginning any clearing/construction activities. Silt fencing will be installed (and maintained) adjacent to the entire area to be leveled and cleared (around all construction sites, pad, access road, and pipeline) so as to minimize the movement of materials from the BLM approved areas of surface disturbance to adjacent lands or drainages. Placement should be along all sides of the pad except for those areas needed for vehicular access. The bales need to be installed, maintained, and replaced in such a manner as to provide effective control of any surface runoff and/or erosion that may occur. A double row of hay bales will be used where necessary. These measures will be effectively

maintained until the well is in active/production stage or has been plugged and abandoned, and successful stabilization, reclamation and restoration is achieved. These erosion control measures are only needed for the duration of construction, drilling/completion, production (only if ground has not been stabilized), and reclamation as needed to prevent soil movement.

9. The access road and pad may be surfaced with rock aggregate per operator and surface owner's agreement. Surfacing or additional surfacing will be required in the event there is resource or excessive road damage.
10. BMPs are required to reduce fugitive dust, including spraying all construction areas with water if the ground is not sufficiently moist to keep dust to a minimum.
11. Develop a Spill Prevention and Contamination Countermeasure Plan (SPCC) prior to beginning any surface disturbing activities. Implement the SPCC during all phases of development.

Drilling/Production:

12. All production related facilities/equipment will be painted, and all painted surfaces will be maintained to ensure its integrity, according to API, BLM, and surface owner specifications.
13. A fluid impermeable secondary containment dike/berm will be constructed/placed around any tank battery and facilities according to 40 CFR 112.7. No sumps, pumps, drains, lines or other means will be used to remove/discharge water collected within the secondary containment except to remove for on-site storage/off-site disposal via approved storage tanks and/or transport systems. The dike/berm and the entire containment area will be graveled. A step or walkway will be placed over the dike/berm to gain access to the tank battery.
14. Line all ditches associated with the drilling process. These lined ditches will effectively catch and direct the flow of fluids involved in rig operations. The liner used will be an impervious material. These lined ditches will effectively drain into the lined sumps/lined cellar and will be effectively maintained to prevent the migration of drilling fluids (produced or waste) into soils or ground water.
15. Line all sumps with impervious material (steel or concrete preferable) on all sides, and bottom. These sumps will, at all times, be below the level of the ditches so that the fluids in the ditches can flow into the sump without coming into contact with the soil or any other earthen layer. These sumps must be emptied before overflowing. These sumps will be covered so as to prevent accidental entry by migratory birds.
16. Make the rat hole and mouse hole impervious by installing cylinders (conductors, culverts or tin-horns) with concrete bottoms. The cylinders shall be installed in such a manner so as to prevent fluids from the pad surface from running into the cylinders, or entering between the cylinders and the earthen wall of the rat and/or mouse hole. The top of the cylinder should be above the pad surface. One option is to pour cement around the outside of the cylinders between the cylinders and the earthen hole. The cement could also be poured/formed at an incline or raised (like a collar) above the ground level.

17. Line the drilling cellar (concrete, metal, etc) so as to make it as impervious as possible to prevent liquids discharged from the drill hole, or drained from the pad surface, from percolating into the soil. If needed, a pump will be installed to transfer fluids in the cellar to one of the lined sumps. The cellar will not be allowed to overflow.
18. Exercise caution and care when removing any of the impervious liners (geo-membrane, concrete, steel, etc.). The liquids and solids which have collected on/in the impervious liners will not be allowed to come into contact with the pad surface, parent soil or any other earthen layers during the cleanup of the site. The liners will be properly cleaned prior to removal or removed in such a manner so as not to allow liquids/solids to escape. Preferably the liner will be washed off into lined ditches, lined sumps or into the lined cellar and then pumped to the lined sumps prior to being removed.
19. Dike & berm the tank battery that will receive fluids from this well. The dike/berm will be impervious and designed according to requirements of 40 CFR 112. The EPA has a booklet (July 1992) available titled "Information on SPCC Plans – 40 CFR 112." Page 20 of this booklet describes, in detail, how tank battery dikes (berms) are to be constructed.
20. If the well is successful, all production equipment, facilities and tanks including well-head and above-ground piping/equipment shall be properly enclosed to exclude livestock if present.
21. If a compressor or pump-jack shall be used at any point over the life of the well, noise mitigation may be required at the discretion of the landowner. If noise mitigation is required, a 48.6 dB[A] Leq noise level will be enforced 100 feet from a dwelling/home in a direct line between the noise source and the dwelling/home
22. During all drilling and producing operations the location and access road will be policed and kept free from all debris and garbage. Any temporary living quarters or restroom facilities will be self-contained and hauled to an approved disposal site
23. After drilling/completion and/or plugging operations are complete, and prior to reclamation, all contaminated soil, cables, drums, thread protectors, trash/debris, and unnecessary materials/equipment or imported gravel, etc., shall be removed and hauled to an authorized permitted disposal facility
24. The entire area will be returned to its original contour or as directed by the surface owner. Stockpiled topsoil will be returned to all disturbed areas or, if needed, clean soil or topsoil would be added. All disturbed areas should be ripped to a depth of 12-24 inches and disked prior to topsoil placement and seeding.
25. Establish vegetation on all areas of the location to be reclaimed. This phase of the reclamation process should be accomplished by using seed or sod. Current policy recommends that these areas be restored with native vegetation in regards to both species and structure (grass, shrubs or trees). In those areas where trees or shrubs are planted, grass should be planted in conjunction to provide

stabilization until trees are mature. This recommended reclamation is contingent upon the wishes of the surface owner and/or the surface management agency. Seeding will be repeated if a satisfactory stand is not obtained as determined by the Authorized Officer upon evaluation after the second growing season.

26. Use only certified weed-free seed. It is recommended to use the appropriate seed mixture, according to NRCS site guidelines, for the site unless the surface owner or surface managing agency prefers a different seed mix. Under no circumstances should the seed mixture contain any species listed by the State of Oklahoma as noxious or invasive.
27. If well drilling, completion and development are successful; all areas of the surface disturbance (i.e. well pad, access road, pipeline, etc) that are not needed or used in the production or operation of the well shall be reclaimed as described in the approved APD
28. If well drilling, completion and development are not successful, the reclamation process will begin within sixty (60) days of the rig-release and completed within thirty (30) days, weather permitting, unless approved otherwise by the BLM and surface owner.
29. After the well is no longer in production, complete reclamation of the site will begin as soon as possible, but in no case longer than sixty (60) days from final plugging of the well and completed within thirty (30) days, weather permitting, unless approved otherwise by the BLM and surface owner.
30. The final fill slope prior to re-seeding will not be steeper than a 3:1 Ratio. To obtain this ratio, pits and slopes will be back-sloped into the pad upon completion of drilling. Construction slopes can be much steeper during drilling, but will be re-contoured to the above ratio during reclamation. Production equipment (including any facilities associated with pipeline construction) will be placed on location as not to interfere with reclaiming the cut and fill slopes to their proper ratio. If equipment is found to interfere with the proper reclamation of the slope, the company will be required to move the equipment so proper re-contouring can occur.

The Bureau of Land Management (BLM) and the United States Fish and Wildlife Service (Service) have cooperatively developed the following 12 Wildlife Resource General Conditions of Approval (WRGCOA's). These WRGCOA's are conservation measures (CM's) in all of BLM's (in-house) biological evaluations. These required WRGCOA's are incorporated into all approved permits issued by BLM for mineral extraction projects. The BLM does not normally require certain technologies to accomplish goals, but rather identifies the end goal, allowing the Operator to determine the optimal approach for accomplishing that goal. They are designed to minimize impacts (cumulative and otherwise) to ground water, surface water, wetlands, riparian zones, migratory birds, threatened and/or endangered species and other significant biological resources.

The operator (&/or their assigns) will:

1. **NTL-96-01-TDO** The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between and among the U.S., Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the MBTA, incidental, unintentional, and accidental take, killing, or possession of a migratory bird or its parts, nests, eggs or products, manufactured or not, without a permit is unlawful. The MBTA has limited provisions for a permitting process which allows for regulated "take" of migratory birds. The BLM requires that the Operator follow all guidelines set forth in the Tulsa District Office Notice to Lessees and Operators (NTL-96-01-TDO) under permits issued by the BLM with the jurisdiction of. This federal and Indian oil and gas leases operating NTL facilitates BLM oil and gas permitted activity through required procedure designed to minimize bird and bat mortality. Modification requirements regarding all open-vent exhaust stacks, open earthen pits, and open-topped tanks are clearly addressed in the NTL-96-01-TDO, and can be found at the following web address:

www.blm.gov/nm/st/en/prog/energy/oil_and_gas/notice_to_lessees/ntl_96-01.html

2. **American Burying Beetle.** Follow all BLM and Service protocol established regarding areas where the American burying beetle (ABB) is known or suspected to exist. The US Fish and Wildlife Service has established a protocol for increasing protection of American burying beetles in areas where they are known to exist and possibly over-winter. The Service is clear regarding ABB protocol, including survey procedures and time/distance regulations. Burying of transmission lines cannot be implemented in known ABB habitat during the over-winter period. The web-site describing ABB protocol is located at:
<http://www.fws.gov/southwest/es/oklahoma/beetle1.htm>
3. **Pipelines and Wetlands** Specific surface water BMP control measures will be implemented prior to any surface disturbance activity where wetland habitat exists. These BMP control measures will effectively prevent the flow of sediment loaded surface water during rain events into the wetland area. Surface water runoff that can impact wetlands detrimentally include but are not limited to that which runs off lease roads and well pad areas. Consideration must also be given to all pipeline installation in wetland areas. Pipeline installation will be implemented in a manner that does not impact wetland habitat. An example of this would be to bore under encountered wetlands rather than trench through them. It is the Operators responsibility to employ measures that protect wetlands from their activities.
4. **Transmission Lines.** For the purpose of this WRGCOA, BLM permitted projects occur in either a Service designated lesser prairie chicken county, not in a Service designated lesser prairie chicken county, or in an American burying beetle designated county; and will require one of the following approaches:

If in a Service designated lesser prairie chicken county:

Vertical structures can deter lesser prairie chicken (LPC) presence even in a preferred area or habitat. This is due to the vertical structures supplying a perch for birds that prey on LPC. Anthropogenic vertical structures such as power poles can be avoided in LPC designated counties by burying of all transmission lines. All BLM permitted projects that occur in a Service designated LPC county will be required to bury all transmission lines. The burying of the transmission lines shall also be undertaken in a manner as to minimize destruction of preferred LPC vegetative habitat. This can be accomplished by use of special equipment such as rubber tired (single pass) vehicles capable of laying materials underground minimizing surface disturbance. Temporary pipelines or other conduits needed to supply the drilling location with fresh water are not affected by this requirement and may remain on the surface and do not need to be buried.

If not in a Service designated lesser prairie chicken county:

Birds of prey, or raptors, are especially vulnerable to collision and/or electrocution because of their size and hunting behavior. Power poles that have inadequate spacing between the phases (hot wires), or unnecessary grounded metal, can kill raptors. All above ground transmission lines shall be constructed in such a way as to minimize electrocution of birds. This simple measure can be completed through construction of perch guards and the like. Detailed information and additional guidelines can be found in *"Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1981"*, available from the Raptor Research Foundation, Inc. No above ground utility poles or wires are allowed in association with this permit to drill. Elevated electrical or telephone lines (and the poles such utilities are suspended from) pose a collision and/or electrocution hazard for migratory birds. Temporary pipelines or other conduits needed to supply the drilling location with fresh water are not affected by this requirement and may remain on the surface and do not need to be buried. Temporary pipelines or other conduits needed to supply the drilling location with fresh water are not affected by this requirement and may remain on the surface and do not need to be buried.

If in a Service designated American burying beetle county:

Follow the Service American burying beetle protocol and WRGCOA #2.

5. **40 CFR 112:** Properly bermed tank batteries can prevent unnecessary contamination of the surface, surface water pathway, and groundwater. Contamination of any of the pathways can directly impact general wildlife and the environment. The BLM requires the Operator to dike & berm the tank battery that will receive fluids from this well. The dike/berm will be impervious and designed according to requirements of 40CFR 112. The EPA has a booklet (July 1992) available titled *"Information on SPCC Plans – 40 CFR 112"*. Page 20 of this booklet describes, in detail, how tank battery dikes (berms) are to be constructed.

6. **Vegetative Establishment:** The BLM requires the establishment of vegetation on all areas of the location to be reclaimed. This phase of the reclamation process should be accomplished by using seed or sod. Current policy recommends that these areas be restored with native vegetation in regards to both species and structure (grass, shrubs or trees). In those areas where trees or shrubs are planted, grass should be planted in conjunction to provide stabilization until trees are mature. This recommended reclamation is contingent upon the wishes of the surface owner and/or the surface management agency.
7. **Erosion Control:** The BLM requires that erosion control measures prior to beginning any construction activities be effectively employed. These erosion control measures will be installed (and maintained) outside of the entire area to be leveled and cleared (around all construction sites; pad, access road and pipeline) so as to effectively minimize the movement of materials from the BLM permit site to adjacent lands or drainages. These measures will be effectively maintained until the well is producing or has been declared a dry hole and plugged. These erosion control measures are required for the duration of the construction, drilling and completion phases of this project and not for the life of the well.
8. **Impervious Liners:** Drilling operation fluids can contaminate the environment. The BLM requires that the Operator install an impervious liner under the drilling rig structure. Usually this will be the drilling rig substructure, operating equipment (diesel engines) and storage tanks (diesel fuel, lubricants, antifreeze, etc.); not the entire pad. This liner should extend into sumps and the cellar and into and along the ditches to prevent any fluids associated with the drilling process from coming into contact with earthen material. This liner will be washed off into lined ditches, lined sumps or into the lined cellar and then pumped to the lined sumps prior to being removed from the location. Metal catch pans may be used on isolated engines and/or storage tanks where the impervious liner may not be practical. The catch pans, if used, will need to be pumped and/or drained (not allowed to overflow). The contents of the metal catch pans may go to the lined sumps, lined cellar or pumped into tanks/trucks for disposal purposes.
9. **Sumps:** To further insure and minimize possible contamination of the environment, the BLM requires that all sumps be lined with impervious material (steel or concrete preferable) on all sides, and bottom. These sumps will, at all times, be below the level of the ditches so that the fluids in the ditches can flow into the sump without coming into contact with native soil or other earthen layer. These sumps must be emptied before overflowing. These sumps will also be covered so as to prevent accidental entry by migratory birds.
10. **Rat and Mouse Hole:** Additional contaminant control is required by making the rat hole and mouse hole impervious. This can be accomplished by installing cylinders (conductors, culverts or tin-horns) with concrete bottoms. The cylinders shall be installed in such a manner so as to prevent fluids from the pad surface from running into the cylinders, or entering between the cylinders and the earthen wall of the rat and/or mouse hole. The top of the cylinder should be above the pad surface. One option is to pour cement around the outside of the cylinders between the cylinders and the earthen hole. The cement could also be shaped/formed at an

incline or raised (like a collar) above the ground level. Modifications to this approach shall first be cleared by submitting in writing the alternative method to a BLM staff biologist and engineer for review.

11. **Drilling Cellar:** The drilling cellar (concrete, metal, etc) must also be lined so as to make it as impervious as possible to prevent liquids discharged from the drill hole, or drained from the pad surface, from percolating into the soil. If needed, a pump will be installed to transfer fluids in the cellar to one of the lined sumps. The cellar will not be allowed to overflow.
12. **Removal of Impervious Liners:** Improper removal of impervious liners can defeat the purpose of the liner. Exercise caution and care when removing any of the impervious liners (geo-membrane, concrete, steel, etc.). The liquids and solids which have collected on/in the impervious liners will not be allowed to come into contact with the pad surface, parent soil or any other earthen layers during the cleanup of the site. The liners will be properly cleaned prior to removal or removed in such a manner so as not to allow liquids/solids to escape. Preferably the liner will be washed off into lined ditches, lined sumps or into the lined cellar and then pumped to the lined sumps prior to being removed.

The following temporal and spatial conservation measures must be implemented:

- 1) Avoid any take of migratory birds and/or minimize the loss, destruction, or degradation of migratory bird habitat while completing the proposed project or action.
- 2) If the proposed project or action includes a reasonable likelihood that take of migratory birds will occur, then complete actions that could take migratory birds outside of their nesting season. This includes clearing or cutting of vegetation, grubbing, etc.
- 3) If no migratory birds are found nesting in proposed project or action areas immediately prior to the time when construction and associated activities are to occur, then the project activity should proceed as planned.
- 4) If migratory birds are present and nesting in the proposed project or action area, work should cease until fledglings had left the nests on their own.

Please Note: In addition to the above conservation measures and SCOA, the operator will also need to comply with BLM's "General Requirements for all Federal and Indian Oil and Gas Leases" which have been emailed to the Operator with the Approval Email Notice and the Lease Stipulations attached to the lease.

The applicant is responsible for implementing these special conditions of approval to prevent and/or mitigate impacts projected to occur during and after project completion.



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Oklahoma Ecological Services Field Office
9014 EAST 21ST STREET
TULSA, OK 74129
PHONE: (918)581-7458 FAX: (918)581-7467
URL: www.fws.gov/southwest/es/Oklahoma/

Consultation Code: 02EKOK00-2017-SLI-0392

November 16, 2016

Event Code: 02EKOK00-2017-E-00419

Project Name: Hines Federal 1H-0235X

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)). (c) For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

[http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS PDF](http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS%20PDF)

Non-federal entities conducting activities that may result in take of listed species should consider seeking coverage under section 10 of the ESA, either through development of a Habitat Conservation Plan (HCP) or, by becoming a signatory to the General Conservation Plan (GCP) currently under development for the American burying beetle. Each of these mechanisms provides the means for obtaining a permit and coverage for incidental take of listed species during otherwise lawful activities.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit through our Project Review step-wise process <http://www.fws.gov/southwest/es/oklahoma/OKESFO%20Permit%20Home.htm>.

Attachment



United States Department of Interior
Fish and Wildlife Service

Project name: Hines Federal 1H-0235X

Official Species List

Provided by:

Oklahoma Ecological Services Field Office
9014 EAST 21ST STREET
TULSA, OK 74129
(918) 581-7458
<http://www.fws.gov/southwest/es/Oklahoma/>

Consultation Code: 02EKOK00-2017-SLI-0392

Event Code: 02EKOK00-2017-E-00419

Project Type: OIL OR GAS

Project Name: Hines Federal 1H-0235X

Project Description: Well pad, lease road, pipeline

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.



United States Department of Interior
Fish and Wildlife Service

Project name: Hines Federal 1H-0235X

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-98.01673650741577 35.36469805547278, -98.01493138074875 35.36467180786818, -98.0148509144783 35.36341410014559, -98.01672577857971 35.36339441412985, -98.01673650741577 35.36469805547278)))

Project Counties: Grady, OK



United States Department of Interior
Fish and Wildlife Service

Project name Hines Federal 1H-0235X

Endangered Species Act Species List

There are a total of 5 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	Status	Has Critical Habitat	Condition(s)
Least tern (<i>Sterna antillarum</i>) Population: interior pop	Endangered		
Piping Plover (<i>Charadrius melodus</i>) Population: except Great Lakes watershed	Threatened	Final designated	
Red Knot (<i>Calidris canutus rufa</i>) Population: Wherever found	Threatened		
Whooping crane (<i>Grus americana</i>) Population: Wherever found, except where listed as an experimental population	Endangered	Final designated	
Fishes			
Arkansas River shiner (<i>Notropis girardi</i>) Population: Arkansas River Basin (AR, KS, NM, OK, TX)	Threatened	Final designated	



United States Department of Interior
Fish and Wildlife Service

Project name: Hines Federal IH-0235X

Critical habitats that lie within your project area

There are no critical habitats within your project area.



United States Department of Interior
Fish and Wildlife Service

Project name: Hines Federal 1H-0235X

Appendix A: FWS National Wildlife Refuges and Fish Hatcheries

There are no refuges or fish hatcheries within your project area.



United States Department of Interior
Fish and Wildlife Service

Project name: Hines Federal 1H-0235X

Appendix B: FWS Migratory Birds

The protection of birds is regulated by the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). The MBTA has no otherwise lawful activities. For more information regarding these Acts see: <http://www.fws.gov/birds/policies-and-regulations/laws-legislations/migratory-bird-treaty-act.php>
<http://www.fws.gov/birds/policies-and-regulations/laws-legislations/bald-and-golden-eagle-protection-act.php>

All project proponents are responsible for complying with the appropriate regulations protecting birds when planning and developing a project. To meet these conservation obligations, proponents should identify potential or existing project-related impacts to migratory birds and their habitat and develop and implement conservation measures that avoid, minimize, or compensate for these impacts. The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

For information about Birds of Conservation Concern, go to:

<http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>

For information about conservation measures that help avoid or minimize impacts to birds, please visit:

<http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>

To search and view summaries of year-round bird occurrence data within your project area, go to the Avian Knowledge Network Histogram Tools at:

<http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/akn-histogram-tools.php>



United States Department of Interior
Fish and Wildlife Service

Project name: Hines Federal 1H-0235X

Migratory birds that may be affected by your project:

There are 23 birds on your migratory bird list. The list may include birds occurring outside this FWS office jurisdiction.

Species Name	Bird of Conservation Concern (BCC)	Seasonal Occurrence in Project Area
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Yes	Wintering
Bell's Vireo (<i>Vireo bellii</i>)	Yes	Breeding
Burrowing Owl (<i>Athene cunicularia</i>)	Yes	Breeding
Cassin's Sparrow (<i>Aimophila cassinii</i>)	Yes	Breeding
Chestnut-collared Longspur (<i>Calcarius ornatus</i>)	Yes	Wintering
Dickcissel (<i>Spiza americana</i>)	Yes	Breeding
Fox Sparrow (<i>Passerella iliaca</i>)	Yes	Wintering
Golden eagle (<i>Aquila chrysaetos</i>)	Yes	Wintering
Harris's Sparrow (<i>Zonotrichia querula</i>)	Yes	Wintering
Hudsonian Godwit (<i>Limosa haemastica</i>)	Yes	Migrating
Lark Bunting (<i>Calamospiza melanocorys</i>)	Yes	Breeding
Least tern (<i>Sterna antillarum</i>)	Yes	Breeding
Lewis's Woodpecker (<i>Melanerpes lewis</i>)	Yes	Wintering
Little Blue Heron (<i>Egretta caerulea</i>)	Yes	Breeding
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	Yes	Year-round
Long-Billed curlew (<i>Numenius</i>)	Yes	Breeding



United States Department of Interior
Fish and Wildlife Service

Project name: Hines Federal 1H-0235X

<i>americanus</i>)		
Mississippi Kite (<i>Ictinia mississippiensis</i>)	Yes	Breeding
Painted Bunting (<i>Passerina ciris</i>)	Yes	Breeding
Red-headed Woodpecker (<i>Melanerpes erythrocephalus</i>)	Yes	Year-round
Rufous-crowned Sparrow (<i>Aimophila ruficeps</i>)	Yes	Year-round
Scissor-tailed Flycatcher (<i>Tyrannus forficatus</i>)	Yes	Breeding
Short-eared Owl (<i>Asio flammeus</i>)	Yes	Wintering
Swainson's hawk (<i>Buteo swainsoni</i>)	Yes	Breeding

OBS Ref 2016-529-FED-BLM

Dear Ms. Peters,

Nov. 16, 2016

We have reviewed occurrence information on federal and state threatened, endangered or candidate species, as well as non-regulatory rare species and ecological systems of importance currently in the Oklahoma Natural Heritage Inventory database for the following location you provided

Sec. 2-T10N-R8W, Grady County

We found no occurrences of relevant species within the vicinity of the project location as described. However, absence from our database does not preclude such species from occurring in the area.

If you have any questions about this response, please send me an email, or call us at the number given below.

Although not specific to your project, you may find the following links helpful.

ONHI guide to ranking codes for endangered and threatened species

http://vmpinco.ou.edu/heritage/ranking_guide.html

Information regarding the Oklahoma Natural Areas Registry

http://www.oknaturalheritage.ou.edu/registry_faq.htm

Todd Fagin
Oklahoma Natural Heritage Inventory
(405) 325-4700
tfagin@ou.edu



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Oklahoma Field Office
201 Stephenson Parkway, Suite 1200
Norman, OK 73072
www.blm.gov/nm



In Reply Refer to:

Cimerax Energy Company, Proposed Hines Federal 1H-0235X Well Pad Project

Legal Location: Section 31, Township 16 North, Range 12 West and Section 2, Township 10 North, Range 8 West, Grady and Canadian Counties, Oklahoma

EA# DOI-BLM-NM-040-2017-004-EA

CRR# NM-040-2017-018

Natural Resource Specialist. Craig Willems

Open Range Archaeology, LLC conducted a Class III survey for Hines Federal 1H-0235X Well Pad Project on October 18th and 19th, and December 2nd, 2016. They surveyed a total of 101.63 acres. The final version of the report was received in this office in December 2016. No prehistoric or historic sites and no standing structures were located or recorded within the Area of Potential Effect APE. In addition, no fossils were observed in the APE.

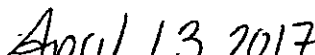
Copies of the report were mailed to the State Historic preservation office (SHPO), the Oklahoma Archeological Survey (OAS), the Bureau of Indian Affairs (BIA Southern Plains Regional and Eastern Oklahoma Regional Offices), the Apache Tribe of Oklahoma, the Cheyenne and Arapaho Tribes, the Chickasaw Nation, the Comanche Nation, the Muscogee (Creek) Nation, the Fort Sill Apache, the Kiowa Tribe, the Osage Nation, the Seminole Nation, and to the Wichita and Affiliated Tribes on March 14, 2017 for comment and review.

SHPO concurred with the recommendations of BLM in a letter dated, April 3, 2017. OAS deferred to SHPO's comments in a letter dated April 12, 2017. Consultation with tribes resulted in eight responses. These comments indicated that no known archeological, historic or sacred sites would be affected by the project

The determination of effect for this project, as staked at the time of survey, is ***No Historic Properties Affected***. It is recommended the project proceed as planned.

If archeological materials such as chipped stone tools, pottery, bone, historic ceramics, glass, metal, or building structures are exposed during construction; stop work at that spot immediately and contact the BLM at 405-579-7100, BIA at 405-247-6673 ext. 265, and the Oklahoma State Historic Preservation Office at 405-521-6249.


Erin Knolles, Archeologist


Date



United States Department of Interior
Fish and Wildlife Service

Project name: Hines Federal 1H-0235X

Appendix C: NWI Wetlands

There are no wetlands within your project area.



United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Oklahoma Field Office
201 Stephenson Parkway, Suite 1200
Norman, OK 73072
405-579-7100



RE: Biological Evaluation for Cimarex Energy Company, Hines Federal 1H-0235X (DOI-BLM-NM-040-2017-000) Grady County, OK. Section 2-10N-8W, SHL: 35.36400345 -98.01603461

The Bureau of Land Management's (BLM) Environmental Assessment (EA) for this project contains all pertinent information regarding the specific characteristics of the proposed wells and associated activity. The purpose of this Biological Evaluation (BE) is to document BLM's "No Effect" determination for all listed species/designated critical habitat for the Hines Federal 1H-0235X proposed project on Endangered Species Act (ESA) listed species, and their designated critical habitat, Special Status Species, based on the analysis done by BLM and to address possible impacts to Wetland and Riparian Habitats, Wildlife and Migratory Birds.

Purpose and Need

The purpose for the proposal is to define and produce oil from the existing federal oil and gas mineral lease issued to the applicant by the Bureau of Land Management (BLM). The Mineral Leasing Act of 1920 (MLA), as amended [30 USC 181 et seq.], authorizes the BLM to issue oil and gas leases for the exploration of oil and gas and permit the development of those leases. The existing lease is a binding legal contract that allows development of the mineral by the holder. An approved Application for Permit to Drill (APD), issued by the BLM, would authorize the applicant's construction and the drilling of the proposed well.

The decision to be made is whether to approve the Application for Permit to Drill (APD), thereby authorizing the applicant to drill the proposed well and well site on the existing federal minerals lease, and allowing for lease development and production under terms of the lease agreement.

Wetland/Riparian Habitat

Wetland habitats provide important wintering and migration habitat for several species of Migratory Birds. Wetlands also provide a link between land and water and are some of the most productive ecosystems in the world. Executive Order (EO) 11990 on the Protection of Wetlands provides opportunity for early review of Federal agency plans regarding new construction in wetland areas. Under EO 11990, each agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for conduction federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating and licensing activities.

A wetland and waterway survey was performed for the proposed project area in order to determine the effect, if any, on aquatic resources. The method used in the BE to determine if an area is a wetland has

been described in Section D of the USACE Wetlands Delineation Manual. Generally, in order to be classified as a wetland an area being observed must satisfy three criteria: hydrophytic vegetation, hydric soils, and wetland hydrology

The composition of the dominant vegetation found within the boundaries of the project area is <50% facultative. This does not satisfy the hydrophytic vegetation condition necessary to indicate a wetland. The Natural Resources Conservation Service Web Soil Survey (NRCS) and the NRCS Soil Survey for Grady County, Oklahoma, was used to determine the soils present in the proposed project area. The proposed project area overlays a series of well drained soils. During the on-site inspection no hydric soil indicators were observed.

The project area does not contain drift lines and does not foster water-impounding topography. There are no indicators the project area contains wetland hydrology.

Threatened/Endangered/Special Status Species

In accordance with the Endangered Species Act of 1973, Federally-listed threatened and endangered species were identified for the proposed project area Consultation Code: 02EKOK00-2017-SLI-0392 Dated: November 16, 2016, Event Code: 02EKOK00-2017-E-00419. These species have the potential to be present in or migrate through Grady County, Oklahoma.

Federally-listed endangered, threatened, proposed, and candidate species for this project area located in Grady County, Oklahoma consist of the Piping plover (*Charadrius melodus*), Least tern (*Sterna antillarum*), Red knot (*Calidris canutus rufa*), Arkansas River shiner (*Notropis girardi*) and the Whooping crane (*Grus americana*)

Species	Status	Conclusion	Impact/Delineation	EIS Section 7
Piping plover (<i>Charadrius melodus</i>)	Threatened	Species not present, no potential habitat present	Habitat assessment indicated no potential habitat present.	No Effect
Least tern (<i>Sterna antillarum</i>)	Endangered	Species not present, no potential habitat present	Habitat assessment indicated no potential habitat present.	No Effect
Red knot (<i>Calidris canutus rufa</i>)	Threatened	Species not present, no potential habitat present	Habitat assessment indicated no potential habitat present.	No Effect
Arkansas River shiner (<i>Notropis girardi</i>)	Threatened	Species not present, no potential habitat present	Habitat assessment indicated no potential habitat present.	No Effect
Whooping crane (<i>Grus americana</i>)	Endangered	Species not present, no potential habitat present	Habitat assessment indicated no potential habitat present.	No Effect
Critical Habitat		No critical habitat present		No Impact

Special Status Species

The group of species referred to in this BE as Special Status Species includes state listed threatened or endangered plant or animal species under the Oklahoma Department of Wildlife Conservation.

The Oklahoma Department of Wildlife Conservation has no species listed for Grady County.

The Oklahoma Natural Heritage Inventory database found no occurrences of relevant species within a 1-mile radius of the proposed project area (OBS Ref 2016-529-FED-BLM, letter dated 11/16/2016).

Wildlife

The private lands of Oklahoma are home to a diversity of unique and interesting wildlife species. Several species may inhabit the project area, such as, dove, turkey, deer, rabbit, squirrels, raccoons, and coyotes. Additionally, many species of songbirds may utilize the project area. Due to this project area located on privately owned surface, comprehensive biological inventories are not available

Migratory Birds

Executive Order (EO) 13186, 66 Fed. Reg. 3853, (January 17, 2001) identifies the responsibility of federal agencies to protect migratory birds and their habitats, and directs executive departments and agencies to undertake actions that will further implement the Migratory Bird Treaty Act (MBTA). Under the MBTA, incidental, unintentional, and accidental take, killing, or possession of a migratory bird or its parts, nests, eggs or products, manufactured or not, without a permit is unlawful. The MBTA has no provisions for a permitting process which allows for regulated "take" of migratory birds. EO 13186 includes a directive for federal agencies to develop a memorandum of understanding (MOU) with the Service to promote the conservation of migratory bird populations, including their habitats, when their actions have, or are likely to have, a measurable negative effect on migratory bird populations.

For the purpose of this BE, the term "migratory birds" applies generally to native bird species protected by the Migratory Bird Treaty Act (MBTA). This includes native passerines (flycatchers and songbirds) as well as birds of prey, migratory waterbirds (waterfowl, wading birds, and shorebirds), and other species such as doves, hummingbirds, swifts, and woodpeckers. The term "migratory" is a misnomer and should be interpreted broadly to include native species that remain in the same area throughout the year as well as species that exhibit patterns of latitudinal or elevational migration to avoid winter conditions of cold or a shortage of food. For most migrant and native resident species, nesting habitat is of special importance because it is critical for supporting reproduction in terms of both nesting sites and food. Also, because birds are generally territorial during the nesting season, their ability to access and utilize sufficient food is limited by the quality of the territory occupied. During non-breeding seasons, birds are generally non-territorial and able to feed across a larger area and wider range of habitats.

Among the wide variety of species protected by the MBTA, special concern is usually given to the following groups:

- Species that migrate across long distances, particularly Neotropical migrant passerines that winter in tropical or Southern Hemisphere temperate zones.
- Birds of prey, which require large areas of suitable habitat for finding sufficient prey.
- Species that have narrow habitat tolerances and hence are vulnerable to extirpation from an area as a result of a relatively minor habitat loss.
- Species that nest colonially and hence are vulnerable to extirpation from an area and hence are vulnerable to extirpation from an area as a result of minor habitat loss.

Because of the many species that fall within one or more of these groups, BLM focuses on species identified by the Service as Birds of Conservation Concern (BCC). Twenty-seven Birds of Conservation Concern are listed for the Central Mixed-Grass Prairie (Bird Conservation Region 19) BCC 2008 list, where this project occurs, the lesser prairie-chicken, little blue heron, Mississippi kite, Bald Eagle, Swainson's hawk, black rail, snowy plover, mountain plover, solitary sandpiper, upland sandpiper, long-billed curlew, hudsonian godwit, marbled godwit, buff-breasted sandpiper, short-billed dowitcher, red-headed woodpecker, scissor-tailed flycatcher, loggerhead shrike, Bell's vireo, Sprague's pipit, Cassin's sparrow, lark bunting, Henslow's sparrow, Harris's sparrow, McCown's longspur, Smith's longspur and the chestnut-collared longspur. The North American Breeding Bird Survey Results and Analysis 1966-2010, breeding bird surveys conducted near the site the (Verden Route) found eight species from the BCR 19 list that are known to nest in or near the proposed project area, the little blue heron, Mississippi kite, Swainson's hawk, red-headed woodpecker, scissor-tld. flycatcher, Bell's vireo, loggerhead shrike and the upland sandpiper.

Environmental Consequences

Wetland and Riparian Habitat

The research analysis and the on-site inspection determined that there is no wetland habitat in the project area; therefore, no impact on wetland habitat is expected.

Threatened and Endangered Species

No Federally protected species or critical habitat is present in the proposed project location. As well, there is no potential habitat for any listed species present. Implementation of the proposed project would have "No Effect" on any threatened and endangered species or their critical habitat.

Special Status Species

No State listed species or their critical habitat is present in the proposed project area. As well, there is no potential habitat for any listed species present. Implementation of the proposed project would have "No Effect" on any State listed species or their critical habitat

Wildlife

The proposed action would remove food, cover, and space for wildlife in this area. The more mobile species will move away from the area during the construction, drilling, and well completion phases of this mineral exploration project to avoid direct mortality, the increase in human presence, and levels of noise. The less mobile species could suffer some mortality during the active construction phase of the project. The immediate area of the drilling/production pad will be unavailable as wildlife habitat while the well is in the drilling/production phases (as long as 20 year or more).

Migratory Birds

The Service estimates that many migratory birds are killed annually throughout the United States in oil field production skim pits, reserve pits, and centralized oilfield wastewater disposal facilities. Numerous grasshoppers, moths, June bugs, and the like become trapped on the surface in tanks and on pits, and become bait for many species of migratory birds. Open tanks and pits then become traps to many species of birds protected under the MBTA. Properly covered tanks and pits (and regularly inspected covered tanks and pits) is imperative to continued protection of migratory birds in the well pad area.

Mitigation

Pursuant to EO 13186 and the MOU between BLM and the Service, entitled "To Promote the Conservation of Migratory Birds," the following temporal and spatial conservation measures must be implemented by Cimarex Energy Company and are considered Conditions of Approval for this project.

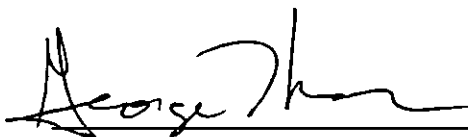
- 1) Avoid any take of migratory birds and/or minimize the loss, destruction, or degradation of migratory bird habitat while completing the proposed project or action
- 2) If the proposed project or action includes a reasonable likelihood that take of migratory birds will occur, then complete actions that could take migratory birds outside of their nesting season. This includes clearing or cutting of vegetation, grubbing, etc.
- 3) If no migratory birds are found nesting in proposed project or action areas immediately prior to the time when construction and associated activities are to occur, then the project activity may proceed as planned
- 4) If migratory birds are present and nesting in the proposed project or action area, work must cease until fledglings had left the nests on their own.

Mitigation Common for all Species

The Wildlife Resource General Conditions of Approval (WRGCOAs) included in the approved APD and use of standard Best Management Practices (BMPs) should provide extra measures of protection to general wildlife populations and habitats in the area. Impacts to the wildlife resource component of the environment can be avoided or minimized by adopting the WRGCOAs and BMPs. Notice to Lessees (NTL) 96-01-TDO (Modification of Oil and Gas Facilities to Minimize Bird and Bat Mortality) address measures designed to protect migratory birds from accidental deaths associated with power line collisions/electrocutions, open-vent exhaust stacks and open pits and tanks

Conclusion

Based on all the information discussed above, and implementation of the WRGCOAs outlined in BLMs approved permit to drill, and BMPs, the biological determination of effect for federally listed species regarding this project is **"NO EFFECT"**



Becky Peters, Wildlife Biologist

For Becky Peters

11/16/2016

Date

OKLAHOMA FIELD OFFICE

APD Geologic Review

OKLAHOMA

Operator Name: Cimarex Energy Co	T&R: Section 2, 10N, 8W	Lease No. OK NM 20396
---	------------------------------------	------------------------------

Well Name: Hines Federal 1H-0235X	County: Grady (The well drills into Canadian County)
--	---

Type of Well: Horizontal Gas

If horizontal, fill out the following:	MTD: 22071'	TVD: 11952'
---	--------------------	--------------------

Kickoff depth, Azimuth, and Vertical Section	11386.5', 0.00 degrees, 9961.92'
---	----------------------------------

TARGET ZONE: Woodford	AGE: Devonian	COMMODITY: Gas
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GEOLOGIC MARKERS:

Name	Age	BLM	Operator	Oil/Gas/Water/Other
Heebner	Pennsylvanian		6744'	
Tonkawa	Pennsylvanian		7327'	
Cottage Grove	Pennsylvanian		8076'	
Hogshooter	Pennsylvanian		8369'	
Checkerboard	Pennsylvanian		8788'	
Cherokee	Pennsylvanian		9858'	
Verdigris	Pennsylvanian	9950'	9967'	
Pink Lime	Pennsylvanian	10200'	10231'	
Red Fork	Pennsylvanian	10275'	10282'	Gas/water
Inola	Pennsylvanian	10425'	10459'	
Atoka	Pennsylvanian		10472'	Gas/water
Morrow	Pennsylvanian		10634'	Gas/water
Chester	Mississippian	10700'	10707'	
Meramec	Mississippian	11650'	11627'	Oil/gas/water
Osage	Mississippian		11886'	
Woodford	Devonian	11900'	11892'	Gas/water
Hunton	Silurian	12050'	12050'	Gas/water

Surface Formation and Age:	Quaternary alluvium
-----------------------------------	---------------------

Depth to Base of Useable Water: 560 feet	Source(s): 260 feet from OWRB machine contoured BTW map 560 feet from OCC machine contoured BTW map
---	---

GEOLOGIC HAZARDS:

Abnormally pressured zones:	Possible zones from the Oswego - Mississippi Lime	Lost circulation zones:	Permian evaporites (Blaine - Wellington) plus Cottage Grove identified
Hydrogen sulfide zones:	None known	Other hazard/concerns:	The well is in a floodplain, so precautions should be taken to prevent damage to the well during flood events. There are no known faults in immediate area of the proposed well and the earthquake potential is in the 2-5%/year damage range.
Abnormal temperature zones:	None known	Other leasable mineral deposits:	None known

CASING:	Planned Depth
SURFACE:	0-1500'
INTERMEDIATE:	0-10654'
PRODUCTION:	0-11387'
LINER:	11387-22072'

COMMENTS:

CA is needed? Yes	(CA OKNM74733 in section 35 does not cover Woodford)
Casing	Operator is using the OCC alternative casing program
Logging	DS & GR, recommend open hole logging from Red Fork to KOP
Water Source	is the S. Canadian River located 1/3 mile east of the location
Downhole Waste Handling	Contain onsite then haul to a commercial disposal facility
Oil Based Mud?	Will store waste onsite then haul to a commercial disposal facility

Geologist: Richard Wymer

Date review began 11/15/2016

Date Review complete:

11/15/2016

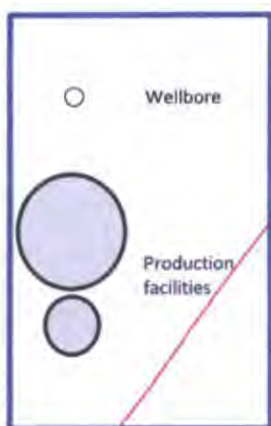
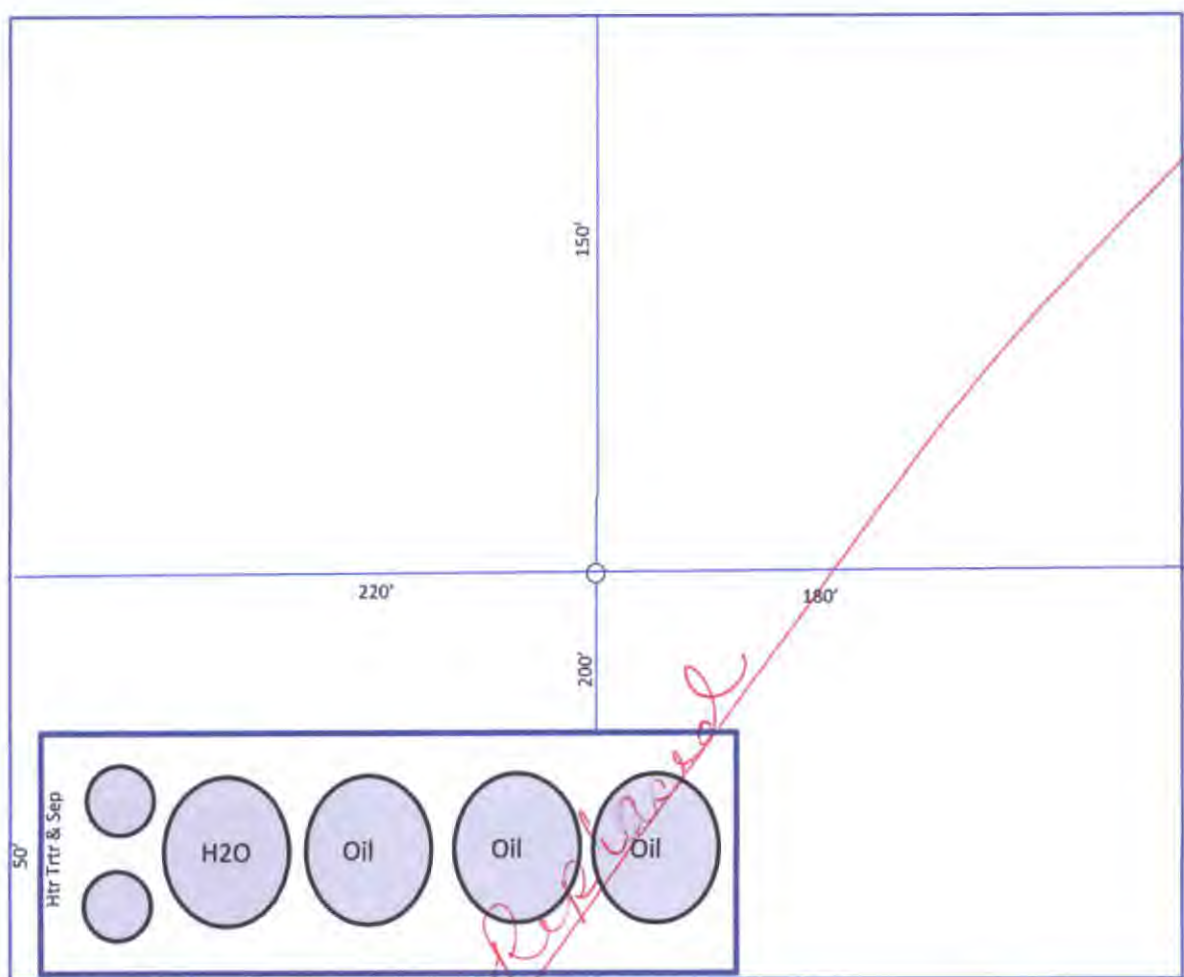


Exhibit E
Preliminary Production Facility Diagram
Hines Federal 1H-0235X
Cimarex Energy Co.
2-10N-8W
Grady Cty, OK

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

5. Lease Serial No.
OKNM20396

6. If Indian, Allottee or Tribe Name

7. If Unit or CA Agreement, Name and No.

8. Lease Name and Well No.
HINES FEDERAL 1H-0235X

9. API Well No.

1a. Type of work: ☒ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone

2. Name of Operator
CIMAREX ENERGY CO

3a. Address
202 S. Cheyenne Ave., Ste 1000 Tulsa OK 74

3b. Phone No. (include area code)
(432)620-1936

10. Field and Pool, or Exploratory
WOODFORD

4. Location of Well (Report location clearly and in accordance with any State requirements.)*

At surface SWSE / 235 FSL / 2410 FEL / LAT 35.3639478 / LONG -98.0157043

At proposed prod. zone NWNE / 165 FNL / 1680 FEL / LAT 35.3640049 / LONG -98.0160316

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 2 / T10N / R8W / IND

14. Distance in miles and direction from nearest town or post office*
0.22 miles

12. County or Parish
GRADY

13. State
OK

15. Distance from proposed*
location to nearest
property or lease line, ft.
(Also to nearest drig. unit line, if any)
235 feet

16. No. of acres in lease
398.05

17. Spacing Unit dedicated to this well
640

18. Distance from proposed location*
to nearest well, drilling, completed, 4261 feet
applied for, on this lease, ft.

19. Proposed Depth
11952 feet / 22071 feet

20. BLM/BIA Bond No. on file
FED: COB000011

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
1278 feet

22. Approximate date work will start*
02/01/2017

23. Estimated duration
30 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).

4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the BLM.

25. Signature
(Electronic Submission)

Name (Printed/Typed)
Aricka Easterling / Ph: (918)560-7060

Date
11/03/2016

Title
Regulatory Analyst

Approved by (Signature)

Name (Printed/Typed)

Date

Title

Office
TULSA

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)

INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM 1: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

ROUTINE USE: Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM collects this information to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

Additional Operator Remarks

Location of Well

I. SHL: 235 FSL / 2410 FEL / TWSP: 10N / RANGE: 8W / SECTION: 2 / LAT: 35.3639478 / LONG: -98.0157043 (TVD: 0 feet, MD: 0 feet)

PPP: 958 FNL / 1671 FEL / TWSP: 10N / RANGE: 8W / SECTION: 2 / LAT: 35.3745775 / LONG: -98.0135769 (TVD: 11952 feet, MD: 14700 feet)

BHL: 165 FNL / 1680 FEL / TWSP: 11N / RANGE: 8W / SECTION: 35 / LAT: 35.3640049 / LONG: -98.0160318 (TVD: 11952 feet, MD: 22071 feet)

BLM Point of Contact

Name:

Title:

Phone:

Email:

Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

WELL FILE

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*5. Lease Serial No.
OKNM20396

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other

8. Well Name and No.

HINES FEDERAL 1H-0235X

2. Name of Operator

CIMAREX ENERGY COMPANY

Contact: TERRI STATHEM

E-Mail: tstathe@cimarex.com

9. API Well No.

35-051-24117

3a. Address

202 S CHEYENNE AVE STE 1000
TULSA, OK 74103-4311

3b. Phone No. (include area code)

Ph: 432-620-1936

10. Field and Pool or Exploratory Area
UNKNOWN

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 2 T10N R8W SWSE 235FSL 2410FEL
35.363948 N Lat, 98.015704 W Lon

11. County or Parish, State

GRADY COUNTY, OK

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input checked="" type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

Cimarex Energy Co. respectfully requests approval to construct the drilling location pad prior to APD approval.

Please see attached drilling location pad diagram for your review and approval.

Adj DCR 4/14

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #371963 verified by the BLM Well Information System
For CIMAREX ENERGY COMPANY, sent to the Tulsa
Committed to AFMSS for processing by DALE ROBINS on 04/14/2017 (17DCR0109SE)

Name (Printed/Typed) TERRI STATHEM

Title MANAGER REGULATORY COMPLIANCE

Signature (Electronic Submission)

Date 04/03/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By See attached

Title

Date

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

Revisions to Operator-Submitted EC Data for Sundry Notice #371963

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type:	NEWCON NOI	NEWCON NOI
Lease:	OKNM28183	OKNM20396
Agreement:		
Operator:	CIMAREX ENERGY COMPANY 202 S. CHEYENNE AVE, STE 1000 TULSA, OK 74103-3001 Ph: 432-620-1936	CIMAREX ENERGY COMPANY 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103-4311 Ph: 918.585.1100
Admin Contact:	TERRI STATHEM MANAGER REGULATORY COMPLIANCE E-Mail: tstathem@cimarex.com Ph: 432-620-1936	TERRI STATHEM MANAGER REGULATORY COMPLIANCE E-Mail: tstathem@cimarex.com Ph: 432-620-1936
Tech Contact:	TERRI STATHEM MANAGER REGULATORY COMPLIANCE E-Mail: tstathem@cimarex.com Ph: 432-620-1936	TERRI STATHEM MANAGER REGULATORY COMPLIANCE E-Mail: tstathem@cimarex.com Ph: 432-620-1936
Location:		
State:	OK	OK
County:	GRADY	GRADY
Field/Pool:	WOODFORD	UNKNOWN
Well/Facility:	HINES FEDERAL 1H-0235X Sec 2 T10N R8W Mer IND SWSW 235FSL 2410FEL	HINES FEDERAL 1H-0235X Sec 2 T10N R8W SWSE 235FSL 2410FEL 35.363948 N Lat, 98.015704 W Lon

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

WELL FILE

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*5. Lease Serial No.
~~-OKNM28183~~ OKNM20396

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

8. Well Name and No.
HINES FEDERAL 1H-0235X

9. API Well No.

10. Field and Pool or Exploratory Area
WOODFORD11. County or Parish, State
GRADY COUNTY, OK**SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other2. Name of Operator
CIMAREX ENERGY COMPANYContact: TERRI STATHEM
E-Mail: tstathem@cimarex.com3a. Address
202 S. CHEYENNE AVE, STE 1000
TULSA, OK 74103-30013b. Phone No. (include area code)
Ph: 432-620-1936

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 2 T10N R8W Mer IND SWSW 235FSL 2410FEL

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input checked="" type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

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For CIMAREX ENERGY COMPANY, sent to the Tulsa

Name (Printed/Typed) TERRI STATHEM

Title MANAGER REGULATORY COMPLIANCE

Signature (Electronic Submission)

Date 04/03/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By

Title

Date

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(Instructions on page 2)

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

APR 04 2017

API NUMBER: 051 24117

Horizontal Hole

Oil & Gas

OKLAHOMA CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION
P.O. BOX 52000
OKLAHOMA CITY, OK 73152-2000
(Rule 165:10-3-1)

Approval Date: 03/28/2017

Expiration Date: 09/28/2017

PERMIT TO DRILL

WELL LOCATION: Sec: 02 Twp: 10N Rge: 8W

County: GRADY

SPOT LOCATION:

SW

SW

SW

SE

FEET FROM QUARTER

FROM

SOUTH

FROM

EAST

SECTION LINES

235

2410

Lease Name: HINES FEDERAL

Well No: 1H-0235X

Well will be 235 feet from nearest unit or lease boundary.

Operator
Name: CIMAREX ENERGY CO

Telephone: 9185851100

OTC/OCC Number: 21194 0

CIMAREX ENERGY CO

202 S CHEYENNE AVE STE 1000

TULSA, OK 74103-3001

ROBERT & CAROLYN HINES

137 COUNTY STREET 2750

MINCO OK 73059

Formation(s) (Permit Valid for Listed Formations Only):

	Name	Depth	Name	Depth
1	WOODFORD	11586	6	
2			7	
3			8	
4			9	
5			10	

Spacing Orders: 661734
587488

Location Exception Orders:

Increased Density Orders

Pending CD Numbers: 201606214
201606213

Special Orders:

Total Depth: 22264

Ground Elevation: 1278

Surface Casing: 1500

Depth to base of Treatable Water-Bearing FM: 240

Under Federal Jurisdiction: No

Fresh Water Supply Well Drilled: No

Surface Water used to Drill: No

PIT 1 INFORMATION

Approved Method for disposal of Drilling Fluids:

Type of Pit System: CLOSED Closed System Means Steel Pits

Type of Mud System: WATER BASED

Chlorides Max. 5000 Average. 3000

D. One time land application - (REQUIRES PERMIT)

PERMIT NO: 17-32208

Is depth to top of ground water greater than 10ft below base of pit? Y

H. CLOSED SYSTEM=STEEL PITS (REQUIRED - CANADIAN RIVER)

Within 1 mile of municipal water well? N

Wellhead Protection Area? N

Pit is located in a Hydrologically Sensitive Area.

Category of Pit: C

Liner not required for Category: C

Pit Location is ALLUVIAL

Pit Location Formation: ALLUVIUM

This permit does not address the right of entry or settlement of surface damages.

The duration of this permit is SIX MONTHS, except as otherwise provided by Rule 165: 10-3-1.

Rule 165: 10-3-4 (c) (7) (e) - The Operator shall give 24 Hours notice by telephone to the appropriate District Office of the Conservation Division as to when Surface Casing will be run.

HORIZONTAL HOLE 1

Sec 35 Twp 11N Rge 8W County CANADIAN

Spot Location of End Point: NW NE NW NE

Feet From: NORTH 1/4 Section Line: 165

Feet From: EAST 1/4 Section Line: 1680

Depth of Deviation: 11431

Radius of Turn: 760

Direction: 2

Total Length: 9639

Measured Total Depth: 22264

True Vertical Depth: 11952

End Point Location from Lease,
Unit, or Property Line: 165

Notes:

Category

Description

DEEP SURFACE CASING

3/23/2017 - G71 - APPROVED; NOTIFY OCC FIELD INSPECTOR IMMEDIATELY OF ANY LOSS OF CIRCULATION OR FAILURE TO CIRCULATE CEMENT TO SURFACE ON ANY CONDUCTOR OR SURFACE CASING

HYDRAULIC FRACTURING

3/23/2017 - G71 - OCC 165:10-3-10 REQUIRES: 1) THE CHEMICAL DISCLOSURE OF HYDRAULIC FRACTURING INGREDIENTS FOR ALL WELLS BE REPORTED TO FRACFOCUS USING THE FOLLOWING LINK [HTTP://FRACFOCUS.ORG/](http://fracfocus.org/) WITH NOTICE GIVEN 48 HOURS IN ADVANCE OF FRACTURING TO THE LOCAL OCC DISTRICT OFFICE; AND, 2) PRIOR TO COMMENCEMENT OF FRACTURING OPERATIONS FOR HORIZONTAL WELLS, NOTICE ALSO GIVEN FIVE BUSINESS DAYS IN ADVANCE TO OFFSET OPERATORS WITH WELLS COMPLETED IN THE SAME COMMON SOURCE OF SUPPLY WITHIN 1/2 MILE

PENDING CD - 201606213

3/27/2017 - G64 - (I.O.) 2-10N-8W & 35-11N-8W
EST MULTIUNIT HORIZONTAL WELL
X661734 WDFD 2-10N-8W
X587488 WDFD 35-11N-8W
XOTHER
50% 2-10N-8W
50% 35-11N-8W
CIMAREX ENERGY CO.
REC. 2-10-2017 (JOHNSON)

PENDING CD - 201606214

3/27/2017 - G64 - (I.O.) 2-10N-8W & 35-11N-8W
X661734 WDFD 2-10N-8W
X587488 WDFD 35-11N-8W
XOTHER
COMPL. INT. (2-10N-8W) NCT 165' FSL, NCT 0' FNL, NCT 1320' FEL
COMPL. INT. (35-11N-8W) NCT 0' FSL, NCT 165' FNL, NCT 1320' FEL
NO OP. NAMED
REC. 2-10-2017 (JOHNSON)

SPACING - 587488

3/27/2017 - G64 - (640)(HOR) 35-11N-8W
EST WDFD
POE TO BHL NCT 165' FNL & FSL, NCT 330' FEL & FWL

SPACING - 661734

3/27/2017 - G64 - (640)(HOR) 2-10N-8W
EXT 643928 WDFD, OTHER
EST OTHER
COMPL. INT. NLT 165' FNL/FSL, NLT 330' FEL/FWL
(COEXIST SP. ORDER 98732/107705 CSTR, MSSLM)

This permit does not address the right of entry or settlement of surface damages.

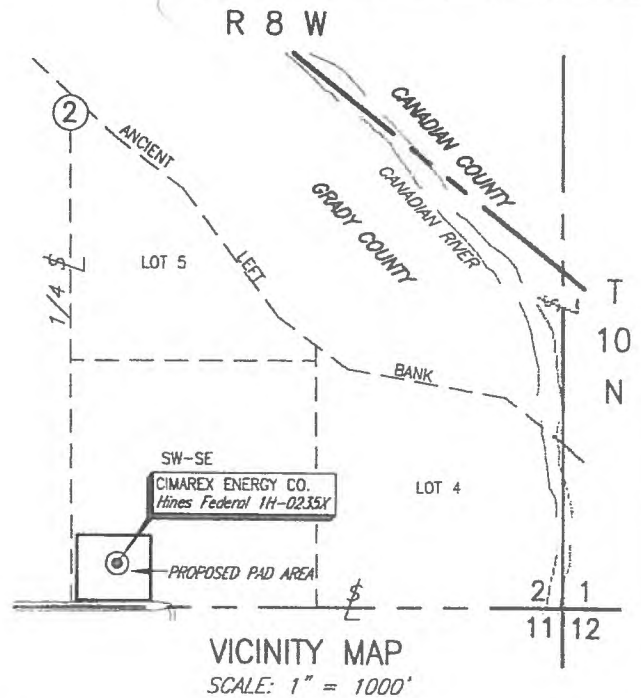
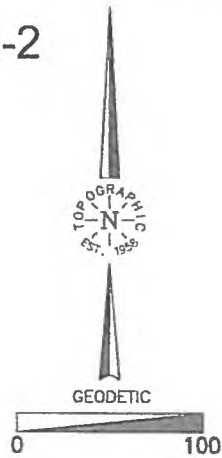
The duration of this permit is SIX MONTHS, except as otherwise provided by Rule 165: 10-3-1.

Rule 165: 10-3-4 (c) (7) (e) - The Operator shall give 24 Hours notice by telephone to the appropriate District Office of the Conservation Division as to when Surface Casing will be run.

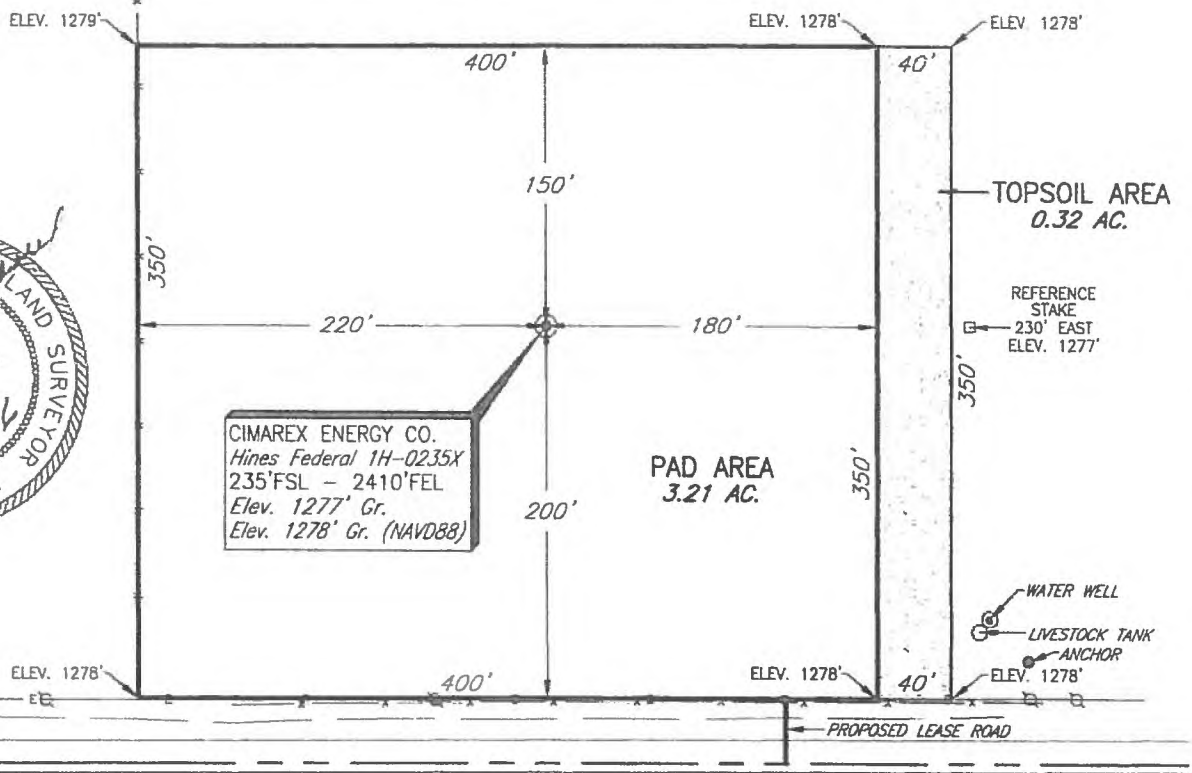
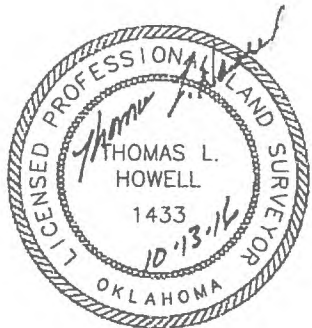
051 24117 HINES FEDERAL 1H-0235X

T 10 N - R 8 W
(INDIAN MERIDIAN)

Exhibit D-2



REFERENCE
STAKE
200' NORTH
ELEV. 1278'



PLAT SHOWING
**PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA**

-NOTE-

The information shown herein is for
construction purposes ONLY.

BASIS OF BEARING:
GEODETIC

BASIS OF ELEVATION:
1270' (NAVD 88)
AT THE SE CORNER OF
SECTION 2 PER OPUS
SOLUTION.

This plat was prepared exclusively for

CIMAREX ENERGY CO.

SURVEYING AND MAPPING BY
TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA

6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847
Certificate of Authorization No. 1293 LS

SCALE: 1" = 100'

DATE: 10-11-16

INVOICE NO.: 266133

FILE: L4129A1.DWG

DWG. NO.: 103134-L4-129-A1

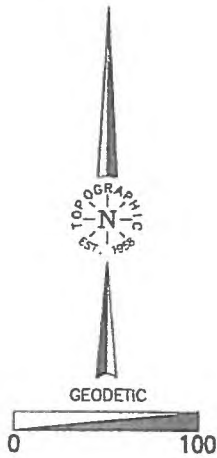
SHEET 1 OF 4

NO.	REVISION	DATE	BY
SURV. BY:	ES	10-10-16	
DRAWN BY:	RKM		
APPROVED BY:	TH		

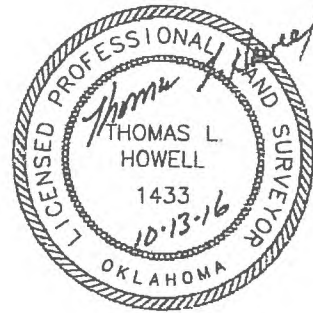
10 N - R 8 W

(INDIAN MERIDIAN)

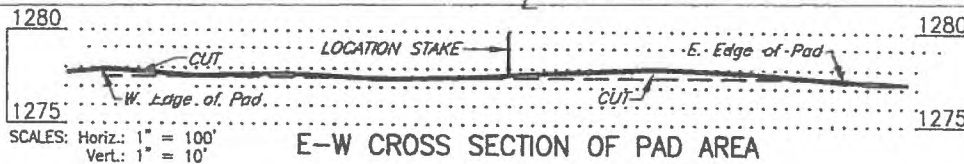
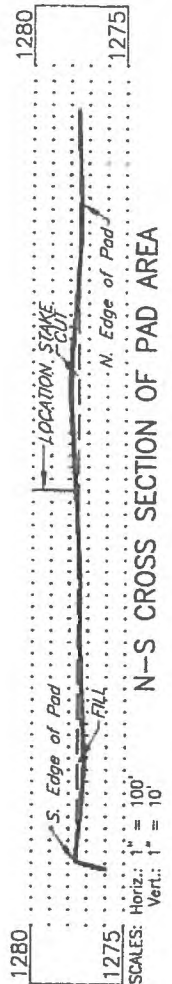
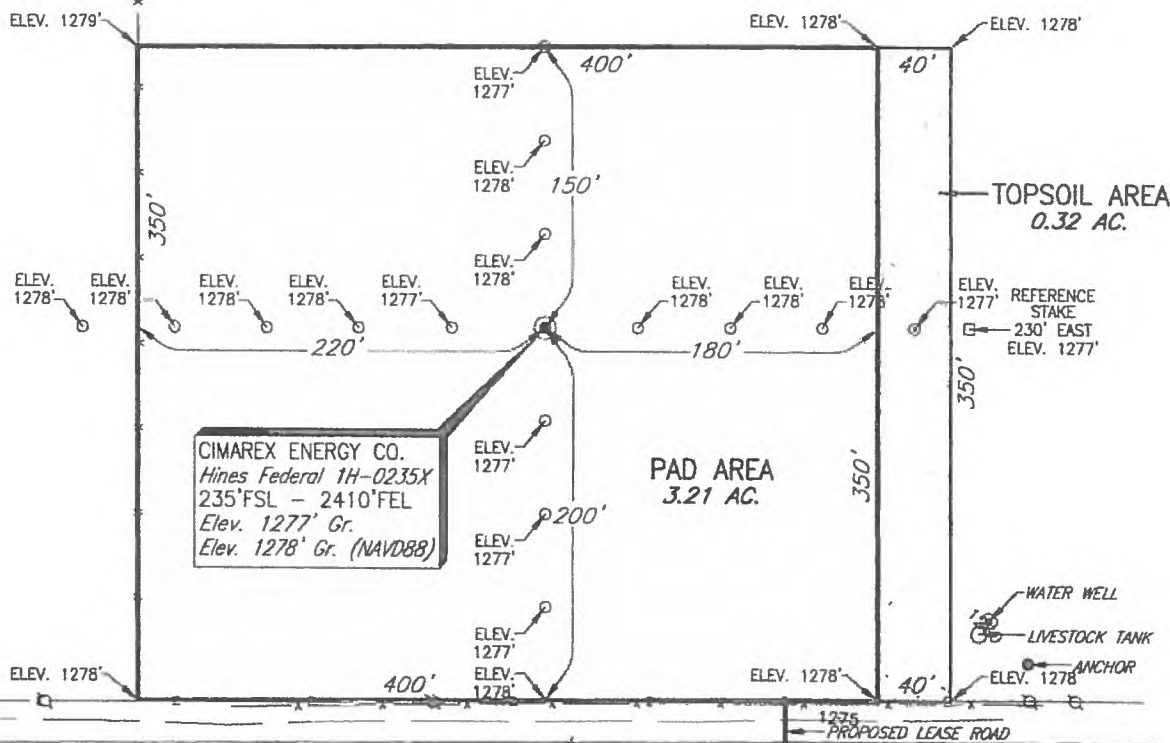
Exhibit D-2



-NOTE-
Elevations were taken at
50' intervals N., S., E.,
& W. of Location Stake.



REFERENCE
STAKE
200' NORTH
ELEV. 1278'



PLAT SHOWING
CROSS SECTIONS OF A
PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA

BASIS OF BEARING:
GEODETIC

BASIS OF ELEVATION:
1270' (NAVD 88)
AT THE SE CORNER OF
SECTION 2 PER OPUS
SOLUTION.

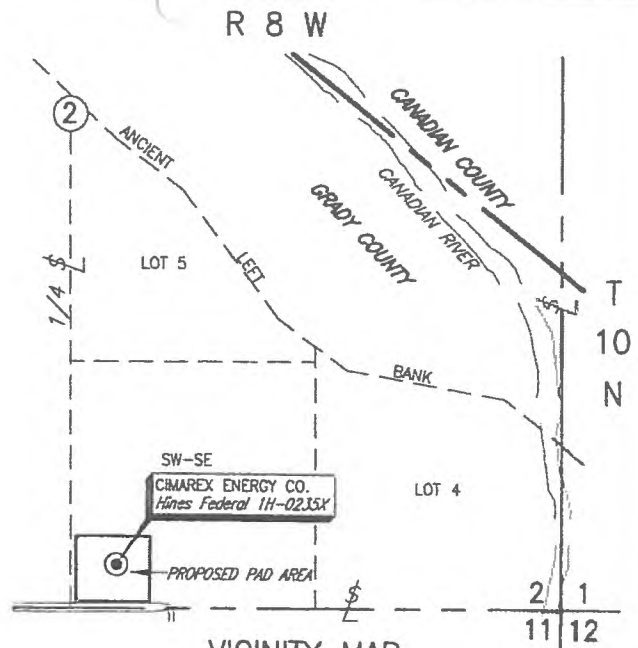
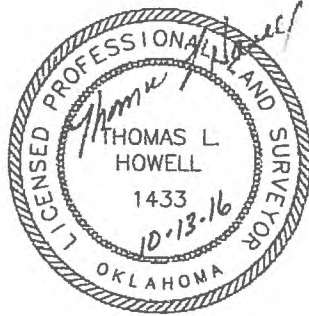
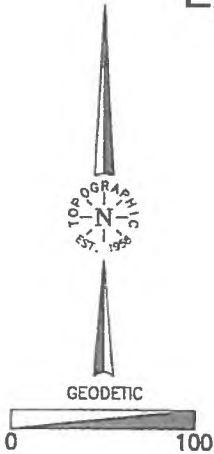
-NOTE-
n

This plat was prepared exclusively for				SCALE: 1" = 100'	
CIMAREX ENERGY CO.				DATE: 10-11-16	
and may not be relied upon by any other entity without the written consent of Topographic Land Surveyors of Oklahoma.				INVOICE NO.: 266133	
NO.	REVISION	DATE	BY	FILE:	L4129A1.DWG
SURV. BY:	ES	10-10-16		DWG. NO.:	103134-L4-129-A1
DRAWN BY:	RKM			SHEET	2 OF 4
APPROVED BY:	TH				
SURVEYING AND MAPPING BY TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA 6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847 Certificate of Authorization No. 1293 LS					

T 10 N - R 8 W

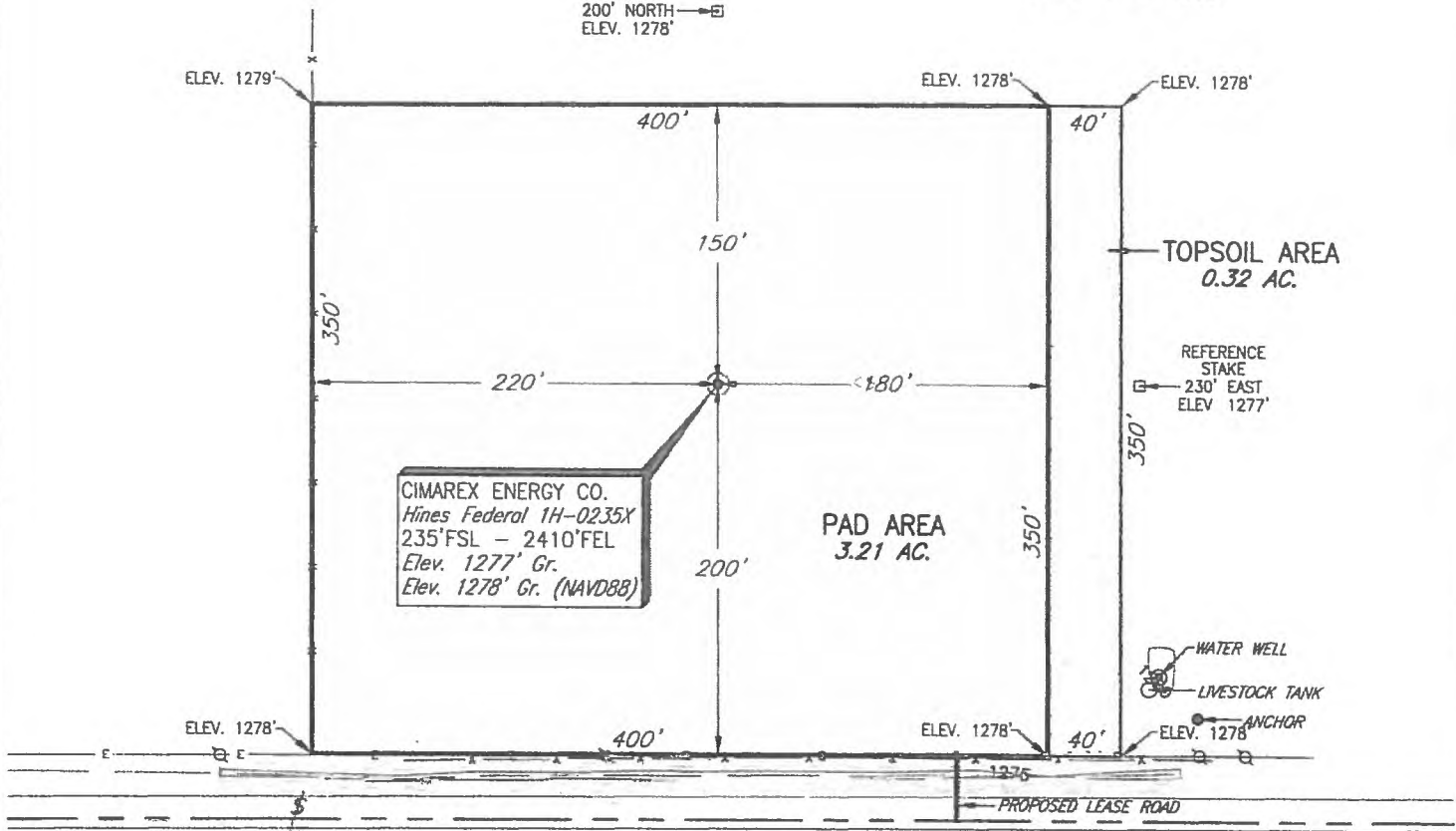
(INDIAN MERIDIAN)

Exhibit D-2



REFERENCE
STAKE
200' NORTH
ELEV. 1278'

VICINITY MAP
SCALE: 1" = 1000'



-NOTE-

PLAT SHOWING
EXISTING CONTOURS OF A
PROPOSED PAD AREA IN THE
SW-SE OF SECTION 2, T10N - R8W
GRADY COUNTY, OKLAHOMA

BASIS OF BEARING:
GEODETIC

BASIS OF ELEVATION:
1270' (NAVD 88)
AT THE SE CORNER OF
SECTION 2 PER OPUS
SOLUTION.

This plat was prepared exclusively for

CIMAREX ENERGY CO.

SURVEYING AND MAPPING BY
TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA

6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847
Certificate of Authorization No. 1293 LS

SCALE: 1" = 100'

DATE: 10-11-16

INVOICE NO.: 266133

FILE: L4129A3.DWG

DWG. NO.: 103134-L4-129-A3

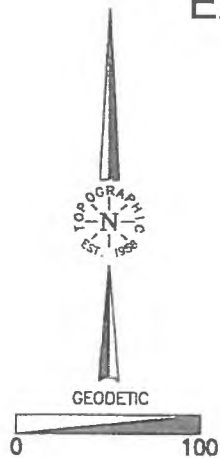
SHEET 3 OF 4

NO.	REVISION	DATE	BY
SURV. BY:	ES	10-10-16	
DRAWN BY:	RKM		
APPROVED BY:	TH		

T 10 N - R 8 W

(INDIAN MERIDIAN)

Exhibit D-2

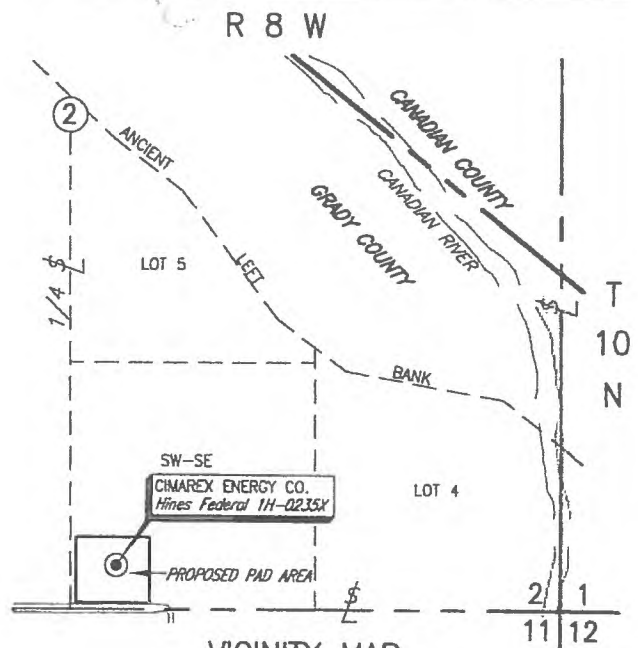


PAD REPORT

Top of pad elevation: 1277.5190
 Cut Slope: 50.00% 2.00:1 26.57'
 Fill Slope: 33.33% 3.00:1 18.43'
 Balance Tolerance (C.Y.): 0.00
 Cut Swell Factor: 1.00
 Fill Shrink Factor: 1.00

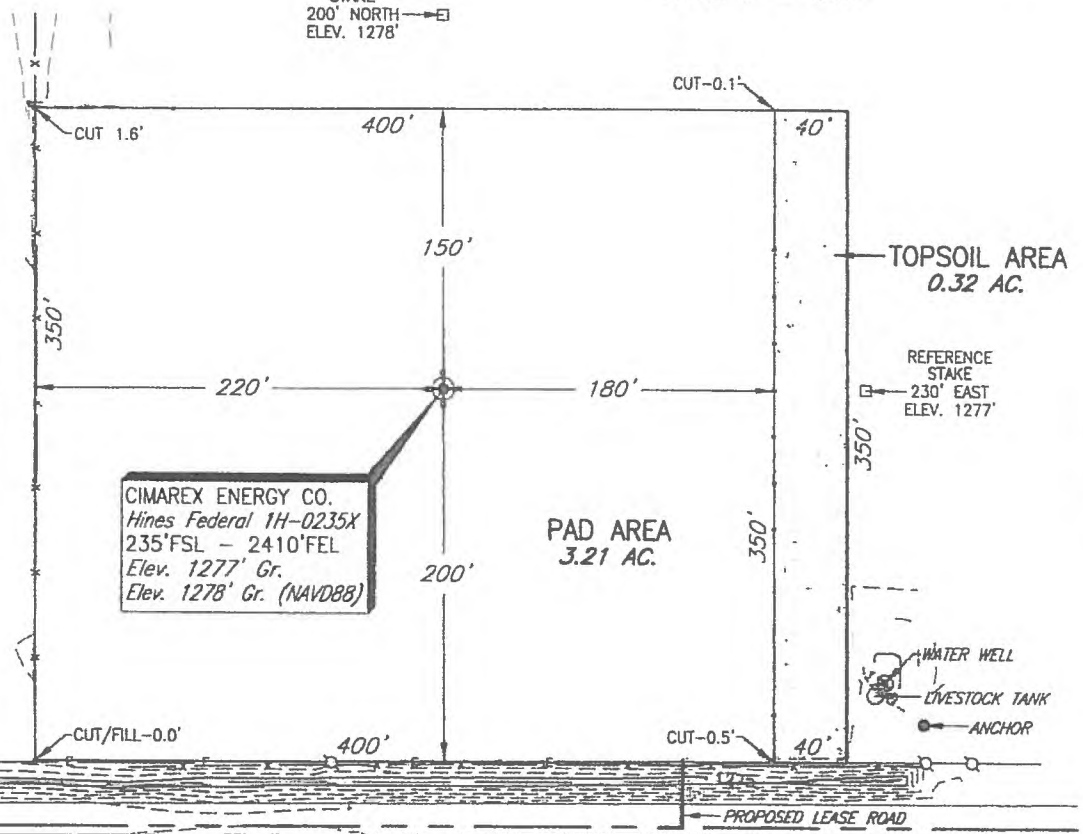
PAD EARTHWORK VOLUMES

Total cut : 16,246.1 C.F., 601.71 C.Y.
 Total fill: 16,199.6 C.F., 599.98 C.Y.
 Balance Export: 46.6 C.F., 1.73 C.Y.
 Area: 140788.9 Sq. Ft., 3.232 Acres



VICINITY MAP
 SCALE: 1" = 1000'

REFERENCE
 STAKE
 200' NORTH
 ELEV. 1278'



-NOTE-

**PLAT SHOWING
 FINAL CONTOURS OF A
 PROPOSED PAD AREA IN THE
 SW-SE OF SECTION 2, T10N - R8W
 GRADY COUNTY, OKLAHOMA**

BASIS OF BEARING:
 GEODETIC

BASIS OF ELEVATION:
 1270' (NAVD 88)
 AT THE SE CORNER OF
 SECTION 2 PER OPUS
 SOLUTION.

This plat was prepared exclusively for				SCALE: 1" = 100'			
CIMAREX ENERGY CO.				DATE: 10-12-16			
and may not be relied upon by any other entity without the written consent of Topographic Land Surveyors of Oklahoma.				INVOICE NO.: 266133			
SURVEYING AND MAPPING BY				FILE: L4129A4.DWG			
TOPOGRAPHIC LAND SURVEYORS OF OKLAHOMA				DWG. NO.: 103134-L4-129-A4			
6709 N. Classen, Okla. City, OK. 73116 (405) 843-4847				SHEET 4 OF 4			
Certificate of Authorization No. 1293 LS							
NO.	REVISION	DATE	BY				
SURV. BY:	ES	10-10-16					
DRAWN BY:	RKM						
APPROVED BY:	TH						

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

WELL FILE

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on page 2

5. Lease Serial No. OKNM20396
6. If Indian, Allottee or Tribe Name
7. If Unit or CA/Agreement, Name and/or No.
8. Well Name and No. HINES FEDERAL 1H-0235X
9. API Well No. 35-051-24117-00-X1
10. Field and Pool or Exploratory Area UNKNOWN
11. County or Parish, State GRADY COUNTY, OK

1. Type of Well <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other	
2. Name of Operator CIMAREX ENERGY COMPANY Contact: KIMBERLEIGH RHODES E-Mail: kirhodes@cimarex.com	
3a. Address 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103-4311	3b. Phone No. (include area code) Ph: 918-560-7081
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 2 T10N R8W SWSE 235FSL 2410FEL 35.363948 N Lat, 98.015704 W Lon	

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original A
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	PD

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

Cimarex Energy Co. respectfully requests changes to the original drilling plan and Rig.

Approved:
Cactus 164
Proposed:
Helmerich and Payne 496

Please see the attached documents.

Adj DCR 4/24
Engr. [Signature]
Adj DCR 5/5

See ATTACHED COA

14. I hereby certify that the foregoing is true and correct. Electronic Submission #373677 verified by the BLM Well Information System For CIMAREX ENERGY COMPANY, sent to the Tulsa Committed to AFMSS for processing by DALE ROBINS on 04/24/2017 (17DCR0123SE)	
Name (Printed/Typed) KIMBERLEIGH RHODES	Title REGULATORY TECH
Signature (Electronic Submission)	Date 04/24/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By EDWARD FERNANDEZ [Signature]	Title PETROLEUM ENGINEER	Date 04/24/2017
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		
Office Tulsa		

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

Revisions to Operator-Submitted EC Data for Sundry Notice #373677

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type:	APDCH NOI	APDCH NOI
Lease:	OKNM20396	OKNM20396
Agreement:		
Operator:	CIMAREX ENERGY CO. 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103 Ph: 918-585-1100	CIMAREX ENERGY COMPANY 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103-4311 Ph: 918.585.1100
Admin Contact:	KIMBERLEIGH RHODES REGULATORY TECH E-Mail: kirhodes@cimarex.com Ph: 918-560-7081	KIMBERLEIGH RHODES REGULATORY TECH E-Mail: kirhodes@cimarex.com Ph: 918-560-7081
Tech Contact:	KIMBERLEIGH RHODES REGULATORY TECH E-Mail: kirhodes@cimarex.com Ph: 918-560-7081	KIMBERLEIGH RHODES REGULATORY TECH E-Mail: kirhodes@cimarex.com Ph: 918-560-7081
Location:		
State:	OK	OK
County:	GRADY	GRADY
Field/Pool:	WOODFORD	UNKNOWN
Well/Facility:	HINES FEDERAL 1H-0235X Sec 2 T10N R8W Mer IND SWSW 235FSL 2410FEL	HINES FEDERAL 1H-0235X Sec 2 T10N R8W SWSE 235FSL 2410FEL 35.363948 N Lat, 98.015704 W Lon

1. Casing Design Changes

Approved:

Name	Casing Depth From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Open Hole Size (inches)	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	BHP (psig)	Anticipated Mud Weight (ppg)	Collapse SF at Full Evacuation(1.125)	Collapse SF at 1/3 Evacuation(1.125)	Burst SF (1.125)	Cumulative Air Weight	Cumulative Buoyed Weight (lbs)	Buoyant Tension SF (1.8)
Surface	0	1500	1500	17 1/2	13-3/8"	54.50	J-55	ST&C	New	663	8.4	1.72		4.18	81,750	71,266	7.21

Requested Change:

Name	Casing Depth From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Open Hole Size (inches)	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	BHP (psig)	Anticipated Mud Weight (ppg)	Collapse SF at Full Evacuation(1.125)	Collapse SF at 1/3 Evacuation(1.125)	Burst SF (1.125)	Cumulative Air Weight	Cumulative Buoyed Weight (lbs)	Buoyant Tension SF (1.8)
Surface	0	1500	1500	17 1/2	13-3/8"	54.50	J-55	BT&C	New	663	8.4	1.72		4.18	81,750	71,266	11.97

8A. Casing Design and Casing Loading Assumptions:

Surface	Tension	A 1.8 design factor with effects of buoyancy: 8.40 ppg.
	Collapse	A 1.125 design factor with full internal evacuation and a collapse force equal to an 8.40 ppg mud gradient.
	Burst	A 1.125 design factor with a surface pressure equal to the anticipated BHP at setting depth. No backup or gas gradient assumed.

Casing Dimensions and Strengths:

										Capacity	
Size, in	Weight, #/ft	Grade	Thread	I.D., in	Drift I.D. in	Cplg O.D., in	Burst, psi	Collapse, psi	Tension, lbs	Bbls/ft	cu. ft./ft/
13 3/8	54.5	J55	BTC	12.615	12.459	14.375	2,730	1,130	853,000	0.1546	0.8680

2. BOPE Requirement below Intermediate

Approved:

10M System. Based on 13.5 ppg MW or 0.702 psi/ft at a 11,952' TVD and equivalent BHP 8390 psi. Using a reduction of pressure to surface of 0.22 psi/ft the required surface equipment must be greater than 5,760 psi.

Requested Change:

5M System.

The 13.5 ppg MW that is used in this area is needed for hole stability issues that are related more to rock matrix integrity and not to the actual pore pressure in the area. Pore pressure in the Woodford

or in the lateral target zone in the area (within the 9 section) has been estimated at a range of 0.58 – 0.63 psi/ft using the flowback method. Using the high end of that range at 0.63 psi/ft and subtracting the 0.22 psi/ft gradient reduction would require a BOPE system greater than 4900 psi. A 5M BOPE system would satisfy this requirement.

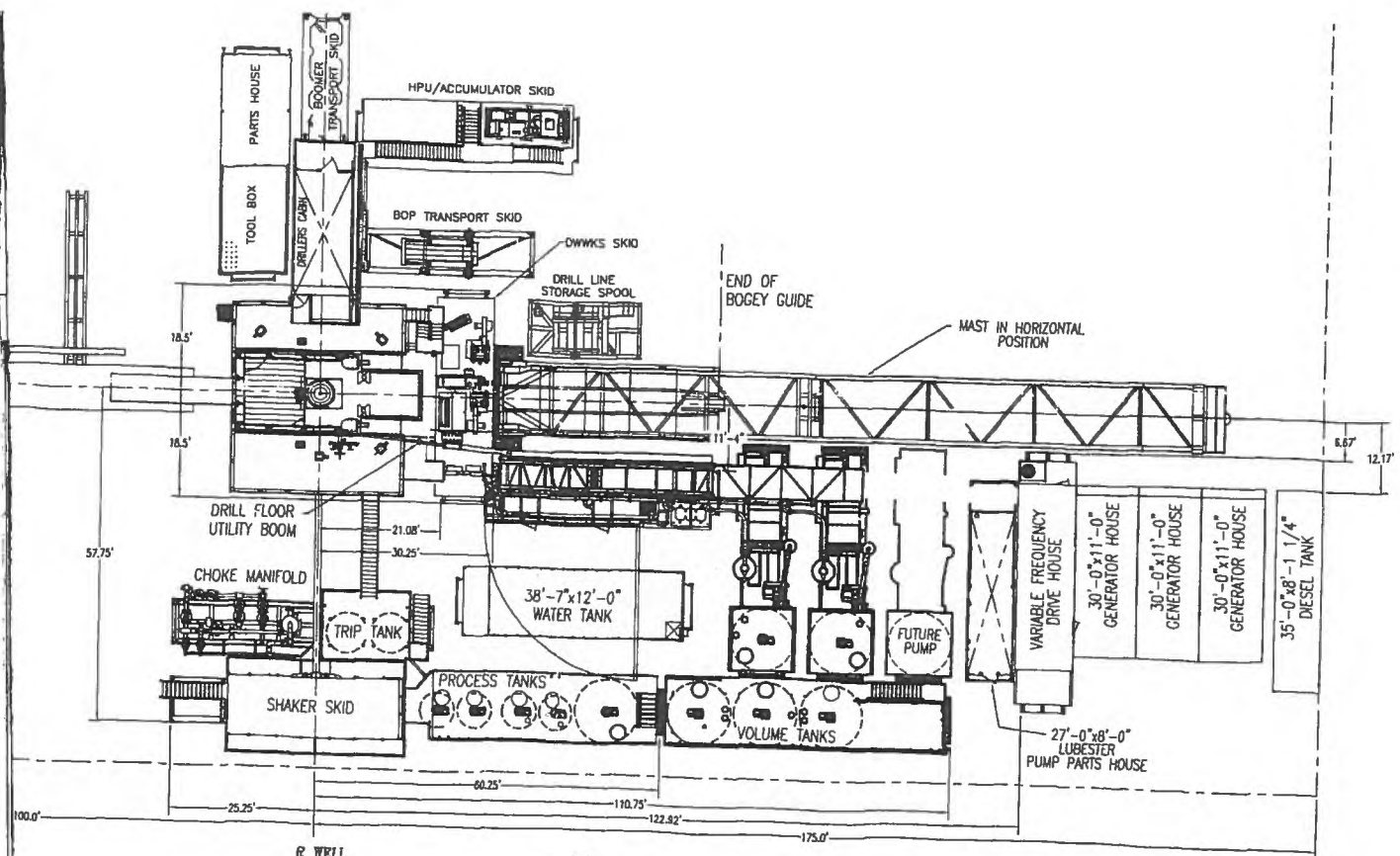
3. Rig Diagram

Approved:

Cactus 164

Requested Change:

Helmerich and Payne 496 (Rig diagrams attached)



PLAN VIEW

ISSUED FOR FABRICATION
 July-02-2002
 DRAFTSMAN
 ENGINEER

ENGINEERING APPROVAL		DATE	
△	4/24/02	UPDATED SITE LAYOUT	ET
△	2-4-02	UPDATED PER MARKUPS	ROB
△	1/21/02	UPDATED ALL REVISED SKIDS	ROB
△	12-06-01	ADDED WATER TANK	WH
△	7/2/02	ADDED DIMS IN TENTHS	JAY
REV	DATE	DESCRIPTION	BY

HELMERICH & INTERNATIONAL DRI

TITLE: RIG 210 SITE LAYOUT

CUSTOMER: H&P

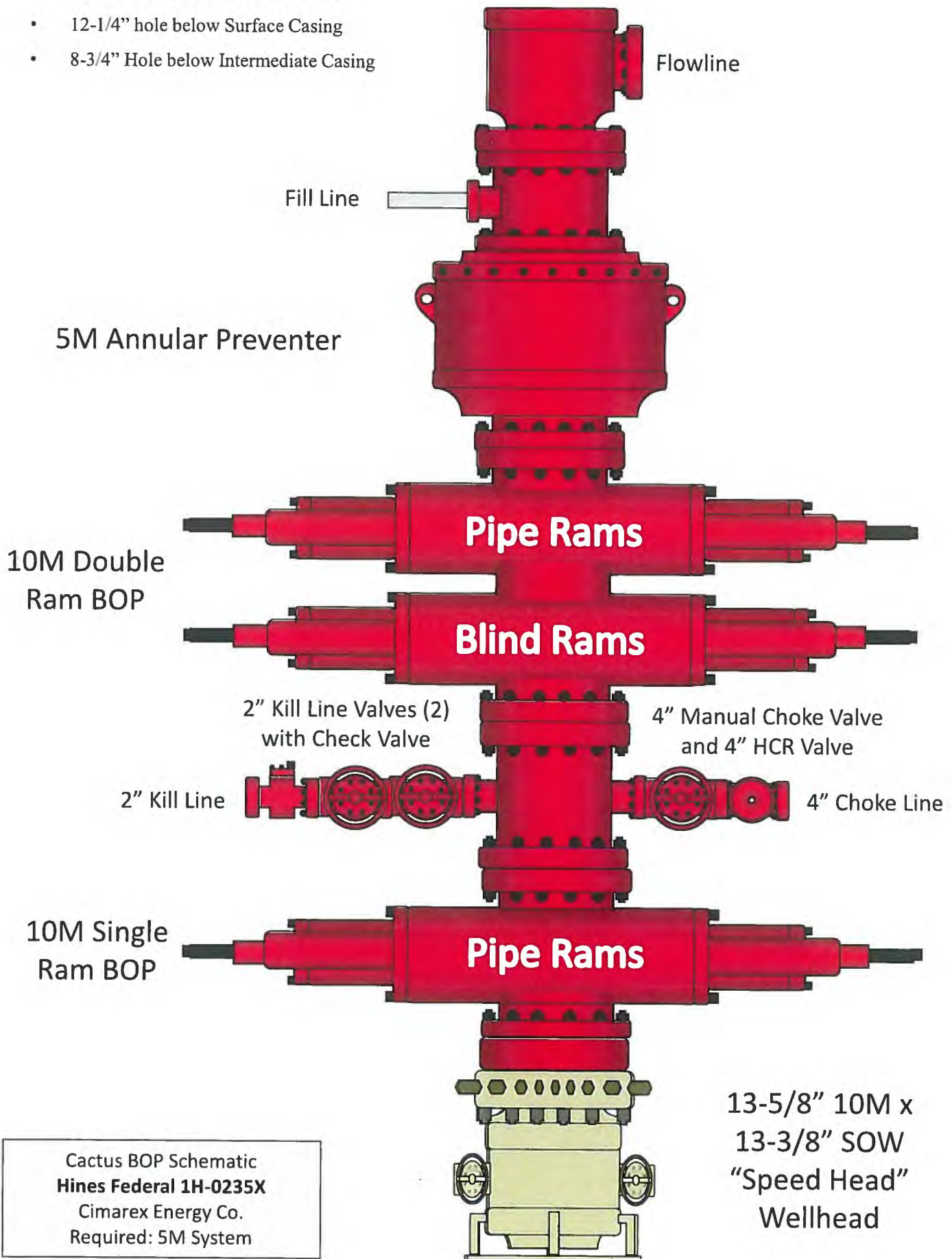
PROJECT: RIG 210

DRAWN: RAY DATE: 6/28/01 DWG. NO.: 210-

SCALE: 3/32"=1" SHEET: 1 OF 1

Hole Sections Utilized

- 12-1/4" hole below Surface Casing
- 8-3/4" Hole below Intermediate Casing



Cactus BOP Schematic
Hines Federal 1H-0235X
Cimarex Energy Co.
Required: 5M System



Fernandez, Edward <efernand@blm.gov>

Hines Federal 1H-0235X - Additional Wording for Sundry Approval

1 message

Brad Cantrell <BCantrell@cimarex.com>
 To: "efernand@blm.gov" <efernand@blm.gov>
 Cc: Terri Stathem <TStathem@cimarex.com>

Mon, Apr 24, 2017 at 4:08 PM

Ed,

Please find additional justification below for the BOPE change as well as an updated schematic attached.

1. BOPE Requirement below Intermediate

Approved:

10M System. Based on 13.5 ppg MW or 0.702 psi/ft at a 11,952' TVD and equivalent BHP 8390 psi. Using a reduction of pressure to surface of 0.22 psi/ft the required surface equipment must be greater than 5,760 psi.

Requested Change:

5M System.

The 13.5 ppg MW that is used in this area is needed for hole stability issues that are related more to rock matrix integrity and not to the actual pore pressure in the area. Pore pressure in the Woodford or in the lateral target zone in the area (within the 9 section) has been estimated at a range of 0.58 – 0.63 psi/ft using the flowback method. Using the high end of that range at 0.63 psi/ft and subtracting the 0.22 psi/ft gradient reduction would require a BOPE system greater than 4900 psi. A 5M BOPE system would satisfy this requirement.

The table below lists required MW at various points in the wellbore:

	Depth	Inclination	Required MW
Drill out of Intermediate Casing	10,674	0 deg	12.1 ppg
KOP	11,389	0 deg	12.1 ppg
Mid Curve	11,800	49.6 deg	12.5 ppg
Landing Point	12,671	90 deg	13.5 ppg
TD	22,071	90 deg	13.5 ppg

Required MW shown above that in excess of the predicted pore pressure (gradient of 0.63 psi/ft (12.1 ppg equivalent) are just for hole stability due to the increased inclination. Cimarex has previously drilled a vertical pilot hole on an offset well approx. 3 mi to the northeast. The pilot was drilled through the proposed target interval into the Hunton and utilized a 10.5 ppg MW with no issues.

BRAD CANTRELL, P.E.

DRILLING & COMPLETION ENGINEER

Cimarex Energy

direct 918-560-7055

mobile 918-640-3615

bcantrell@cimarex.com



Hines Federal Updated BOP Diagram 24APR2017.pdf
481K

ENGINEERING
CONDITIONS OF APPROVAL FOR THE APPLICATION FOR PERMIT TO DRILL
Sundry dated 04/24/2017

Operator: Cimarex Energy Co
Well Name: HINES FEDERAL 1H-0235X
Lease No: OKNM20396

Location:

SHL: 235' FSL & 2410' FEL, (SW¼ SE¼), Sec. 2, T. 10 N., R. 8 W., I.M., Grady County,
Oklahoma

BHL: 165' FNL & 1680' FEL, (NW¼ NE¼), Sec. 35, T. 11 N., R. 8 W., I.M., Grady County,
Oklahoma

A copy of the CONDITIONS OF APPROVAL must be furnished to your field representative.

Original COA still Apply with the following changes.

II. Pressure Control

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API 53.

If the operator plans on using a multi-bowl wellhead assembly

2. Operator has proposed a **multi-bowl wellhead assembly**. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5,000 (5M) psi**.
 - a. Wellhead shall be installed by manufacturer's representatives. Submit documentation with subsequent Sundry Notice.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. **Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.**
 - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
3. **Variance approved to use flex line from BOP to choke manifold.** If you choose to use a flexible hose as opposed to a non-flexible connection between the stack and the choke manifold, the hose must be successfully tested along with the stack over each hole section at the same test pressure of the approved RAM size (RAM test pressure). Check condition of flexible line from BOP to choke manifold and replace if exterior is damaged or if line fails test. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. The

manufactures' specification and hydrostatic pressure test certification matching the hose in service information must be available on request to our inspection and enforcement personnel.

If the operator is not using a multi-bowl well head assembly, Items 4 and 5 apply

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5,000 (5M) psi**.
5. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below intermediate casing shoe shall be **5,000(5M) psi**.

5M/10M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

6. The BLM office shall be notified as stated in General Conditions of Approval above in advance for a representative to witness the BOP tests. All testing shall comply as described in Onshore Oil and Gas Order No. 2 and API 53
 - a. For all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength.
 - b. The tests shall be done by an independent service company utilizing a test plug, **not a cup or J-packer**.
 - c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
 - d. The results of the test shall be reported to the appropriate BLM office.
 - e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
 - f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

V. OTHER VARIANCES TO BLM ORDERS AND REGULATIONS and COA Requirements

1. A variance approved on conditions during testing of intermediate and production casing. Section 8A of drilling program.
2. Surface casing change approved as written.
3. Intermediate is to be kept liquid filled while running in hole to meet BLM minimum collapse safety factor.
4. **A 5M BOP/BOPE system is approved.** BOP/BOPE diagrams submitted with APD and on rig location shall be functionally equivalent to Onshore Order #2 and to the actual equipment on the drilling rig.

EGF 04/24/2017

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Well
File

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other		5. Lease Serial No. OKNM20396
2. Name of Operator CIMAREX ENERGY COMPANY		6. If Indian, Allottee or Tribe Name
Contact: KIMBERLEIGH RHODES E-Mail: KiRhodes@cimarex.com		7. If Unit or CA/Agreement, Name and/or No.
3a. Address 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103-4311	3b. Phone No. (include area code) Ph: 918-560-7081	8. Well Name and No. HINES FEDERAL 1H-0235X
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 2 T10N R8W SWSE 235FSL 2410FEL 35.363948 N Lat, 98.015704 W Lon		9. API Well No. 35-051-24117-00-X1
		10. Field and Pool or Exploratory Area UNKNOWN
		11. County or Parish, State GRADY COUNTY, OK

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION				
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off	
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity	
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other	
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon		
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal		

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

Cimarex Energy Co. respectfully requests a variance to the conditions of approval to run logs on the Hines Federal 1H-0235X.
Attached please find an area map exhibiting adequate log coverage.

Adj DCR 4/21

14. I hereby certify that the foregoing is true and correct. Electronic Submission #373187 verified by the BLM Well Information System For CIMAREX ENERGY COMPANY, sent to the Tulsa Committed to AFMSS for processing by EDWARD FERNANDEZ on 04/20/2017 (17EGF0013SE)	
Name (Printed/Typed) KIMBERLEIGH RHODES	Title REGULATORY TECH
Signature (Electronic Submission)	Date 04/18/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By EDWARD FERNANDEZ	Title PETROLEUM ENGINEER	Date 04/20/2017
------------------------------	--------------------------	-----------------

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office Tulsa

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

Revisions to Operator-Submitted EC Data for Sundry Notice #373187

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type:	OTHER NOI	OTHER NOI
Lease:	OKNM20396	OKNM20396
Agreement:		
Operator:	CIMAREX ENERGY 202 S CHEYENNE AVE 1000 TULSA, OK 74103 Ph: 918-585-1100	CIMAREX ENERGY COMPANY 202 S CHEYENNE AVE STE 1000 TULSA, OK 74103-4311 Ph: 918.585.1100
Admin Contact:	KIMBERLEIGH RHODES REGULATORY TECHNICIAN E-Mail: KiRhodes@cimarex.com Ph: 918-560-7081	KIMBERLEIGH RHODES REGULATORY TECH E-Mail: KiRhodes@cimarex.com Ph: 918-560-7081
Tech Contact:	KIMBERLEIGH RHODES REGULATORY TECHNICIAN E-Mail: KiRhodes@cimarex.com Ph: 918-560-7081	KIMBERLEIGH RHODES REGULATORY TECH E-Mail: KiRhodes@cimarex.com Ph: 918-560-7081
Location:		
State:	OK	OK
County:	GRADY	GRADY
Field/Pool:	WOODFORD	UNKNOWN
Well/Facility:	HINES FEDERAL 1H-0235X Sec 2 T10N R8W SWSW 235FSL 2410FEL	HINES FEDERAL 1H-0235X Sec 2 T10N R8W SWSE 235FSL 2410FEL 35.363948 N Lat, 98.015704 W Lon

1 ANDERSON 1-36					7 KOERNER TRUST 1-12H				
35017210140000					35051235510000				
Density	7697	12126			Gamma Ray	11053	11962		
Gamma Ray	7697	12126			8 KUYKENDALL /A/ 1				
Porosity	7697	12126			35017221870000				
Resistivity	1391	12121			Density	9089	12936		
SP	1391	12121			Gamma Ray	9090	12935		
2 BOLLINGER 1-27HL					Porosity	9089	12936		
35017244190000					Resistivity	1042	12938		
Density	1480	10318			SP	1042	12934		
Gamma Ray	1480	11343			9 MCCOMAS /A/ 1				
Porosity	1480	10318			35051208520000				
Resistivity	1480	10394			Density	9195	12787		
SP	1480	10396			Gamma Ray	9195	12765		
3 FITZGERALD 1-11					Porosity	9195	12787		
35051207070000					Resistivity	1032	12786		
Density	5982	12785			SP	1032	12786		
Gamma Ray	5982	12809			10 MORRISON 36-1				
Porosity	5984	12785			35017227390000				
Resistivity	1999	12810			Density	6688	11716		
SP	1999	12810			Gamma Ray	1156	11712		
4 GARY 1H-3601X					Porosity	6688	11716		
35017248120000					Resistivity	1209	11718		
Gamma Ray	10387	11500			SP	1209	11718		
Resistivity					11 STRAKA 1-1				
SP					35017219220000				
5 GREER 1-3H					Density	6496	12940		
35051235480000					Gamma Ray	1440	12923		
Gamma Ray	10647	11746			Porosity	6488	12925		
6 KOERNER 1-12					Resistivity	1466	12940		
35051231620000					SP	1466	12940		
Density	6473	10598			12 STRAKA 1H-36X				
Gamma Ray	737	10616			35017246960000				
Porosity	6473	10598			Gamma Ray	10300	18944		
Resistivity	788	10598			Resistivity				
SP	782	10610			SP				
					13 VICKERY 1-11H				
					35051236750000				
					Gamma Ray	11600	16950		

Hines Federal 1H-0235X MD Top of WDFD



XEC Hines Federal 1H-0235X

WDFD Structure

February 2, 2017